

TO
THE VERTVOVS GEN-
tlewoman M^{rs}. Dorothy Kemp, wife
to the Right Worshipfull M^r. Robert
Kemp, Esquire, one of his Maiesties Ju-
stices of Peace in the County
of Northfolk.



Oſt vertuous and kinde, f here
present unto your hands and
view, this Treatise not great,
of a ſubiect in ſeeming ſmall,
indeed full of greatnesse and glory. For
bowſoever the body of thiſ little creature,
while ſhe is under ſayle on her airy voy-
age, can ſcarce be apprehended of ſenſe;
yet the admirable power and manifold
wiſdome of the Creator, manifested in
 thiſ his working work, cannot bee com-
prehended by reaſon, no not by the indu-

The Epistle Dedicatory.

strious inquisitors into her busie industry. This therefore hath in many ages busied many of the most learned of Natures Secretaries, to observe the nature, working, policy, thrift, and exquisite perfection of this little Flie, in all affayres of war or peace, at home or abroad: and yet have they all beeene rather brought to height of admiration, than made fit for full explication of the wisdome which (surpassing their owne wisdome) they have found in the Bee. Among others, the Author of this Booke, Father to my selfe and it, was a scholler of this schoole, and hath thus written of their orders and ordering; which he not living to publish, I have presumed to set forth under your Name, as the heire of that love and duty which he bare to the common good, and your selfe; whom in regard of birth, qualities, and fortunes, as gentle, friend-

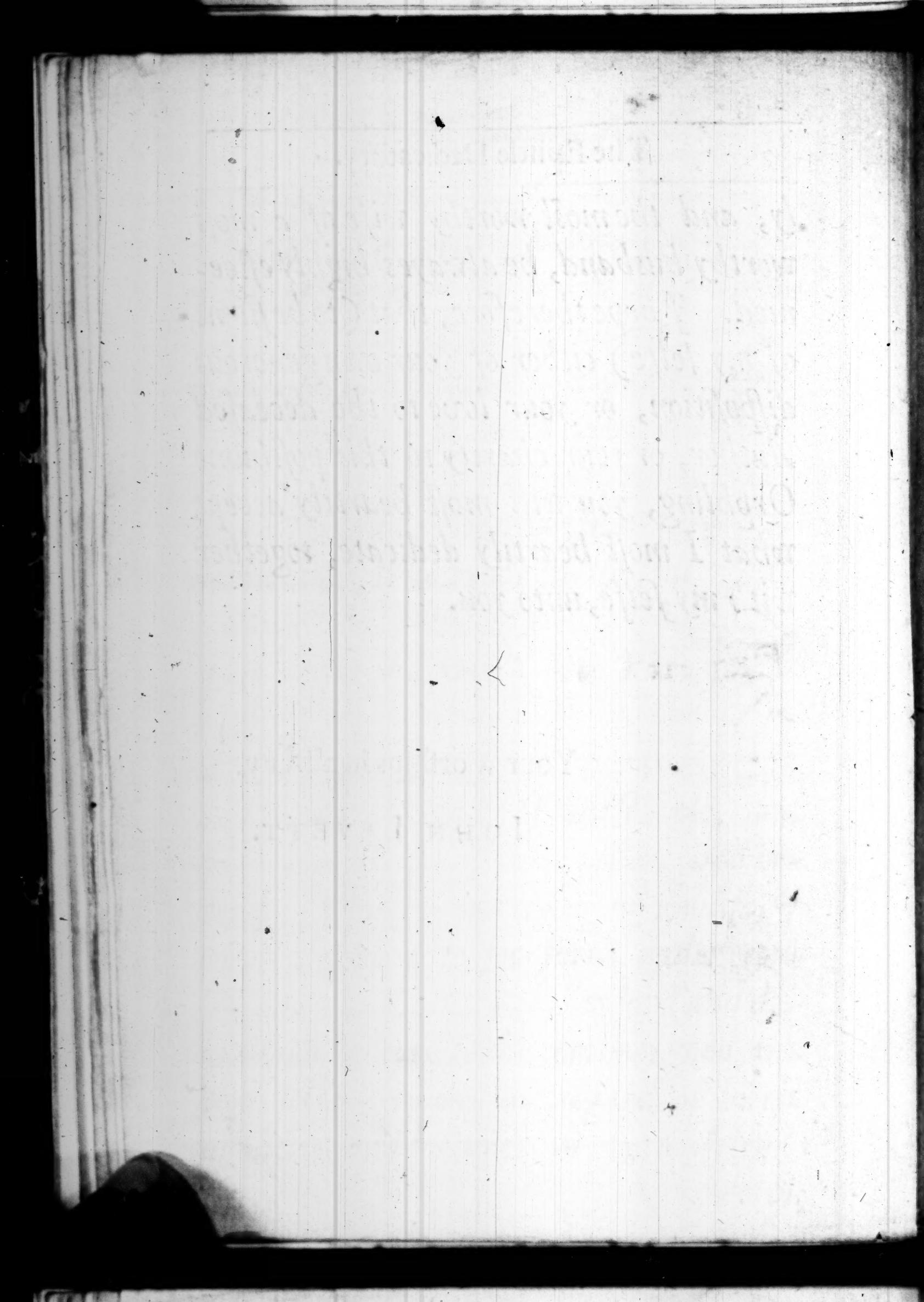
ly,

The Epistle Dedicatory.

ly, and the most worthy wife of a most
worthy husband, he alwayes highly esteeme-
med. I hope therefore, that (to besilent
of my selfe) either of your own generous
disposition, or your love to the deceased
Author, or your charity to this posthume
Orphling, you will most heartily accept
what I most heartily dedicate, together
with my selfe, unto you.

Your Worships in all duty,

JOHN LEVETT.





To the Reader.

Because it is the most usuall manner (friendly Reader) of those that publish any thing in writing, to bestow an Epistle upon the courteous and well-affested Reader, I resolved also to follow the same order : But I stood long in doubt, whether I should do it by way of Apology, for surchargeing the world with more books, whereof that seemeth overfull ; for writing of so meane a subiect, when all mens minds conceit great matters : or for that my selfe, being one of the least, should presume to thrust in my opinion among so many rare, and excellent inventions found out by the curious wits of these dayes : or else following the most ordinary and old fashion, when all men enquire after new, I should fall to commendation of the matter I write of, and the profit and commodity that may grow by the well-ordering of the same. Yet at the last I determined to say something concerning them all.

To the Reader.

they account a part thereof ; whom our English writers following, have not a little erred. And this is the cause that concerning the ordering and keeping of Bees, little is found amongst them (some precepts of Mr. Southerns only excepted) worthy remembrance.

And although that for the breeding, industry, art, and government of Bees, they have written many curious and good observations of the Ancients, which are worthy the knowledge, especially of such as keep Bees ; againe, I was not much diswaded from my intention, because the greatest use of this book will be for the unlearned and Country people, especially good wemen, who commonly in this Country take most care and regard of this kinde of commodity, (although much the worse for the poore Bees) because sometimes they want help, sometimes diligence, but most times knowledge how to use them well. And this principally moved me to undertake this work, which I have performed without Art or Eloquence, and after a different method or order from all those which have formerly written of Bees, having set down every thing that I supposed worthy observation. And notwithstanding ma-

To the Reader.

ny of them at the first sight may peradventure
seeme to bee of little worth, or else needlessle,
for being commonly known to most that keep
Bees : Yet I would intreat your patience in
reading of those also, and I suppose that my
purpose being to teach, I was unwilling to
omit anything (were it never so little) worthy
the noting. Moreover, have I written any
thing contrary to the common received opi-
nion, or different from your conceit ; bee not
over hasty to censure it, but observe and then
try before you give iudgement. And thus
much by way of Apology. Last of all, to con-
clude with the excellency of hony and wax,
let this only suffice, that they are numbred a-
mongst the notable and chiefe commodities of
some Kingdomes, and the very Land of pro-
mise it selfe, to give the Israelites a better liking
unto it, was called the Land that flowed, or to
use our English phrase, abounded with Milk
and Hony, which were esteemed at that time,
amongst the principall earthly commodities
that were to bee expected from the blessing of
God. And as for the profit of this booke, I
referre it to the successe that it shall p[er]lease God
to give in the use of it. *And so Farewell.*

TO THE MEMORIE
OF THE THRICE WORTHY
Gentleman, M^r. JOHN LEVETT
deceased: and to the eternity of his
well-taken-labour in this most ex-
cellent and profitable Re-
lation and History of
B E E S.

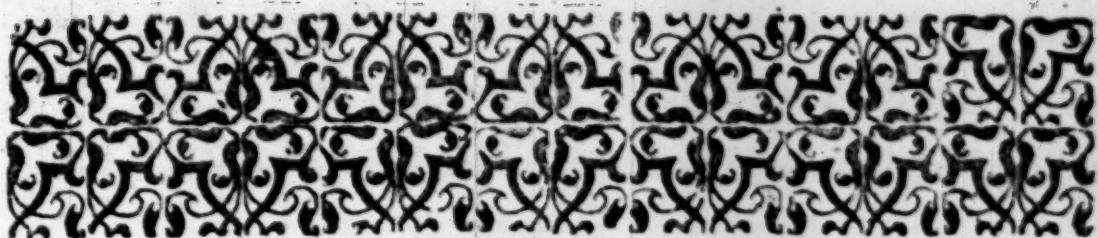
Here are two immortall enemies, which, like Butchers dogges (whose mouthes are ever bloudy) do continually besiege and assault everie good labour, and that is, Curiositie and Envie; the first striving to finde out knots in Rushes or Miracles beyond mans capacitie: the other devou-ring and gnawing upon all vertuous Actions, till, with the poyson of her corrupt Nature, she have brought all wholesome Intents within the compasse of scandall; with these two enemies, if this excellent and well-taken-labour chance not to encounter, it may passe into the world with infinite applause, and well-liking of all men, being a worke so exact and compendiously done. So plaine and easie for the mea-

nest understanding, yet with all so succinct, deepe,
and elaborate, that as a Flie may easily wade it, so
an Elephant may with difficultie swimme in it, not
that there are unresolved Enigmas or things fetcht
beyond the clouds to adorne it, but because the Ex-
periments being new, approved, and allyed both to
truth and Reason, the collections so manifest, and
not to be controlled, the corrections and reconcile-
ments of the errors of others former publishings, so
modestly handled, cleared, and adorned, and the
whole worke so purged from all glosse or flourish of
ayrie words, from the folly of amazing Inventions,
and from the intricate windings, turnings, and re-
turnings of a wilde braine, which many times carries
the Reader into a new world farre beyond all his
acquaintance; That here every good man and good
Minde shall finde as much as he can expect, and yet
no more then is sufficient. For mine owne part, I
have had a singular affection, and an earnest desire
in the pursuit of this knowledge, and was once a
great Master of these creatures; neither have I spa-
red to bestow my pen in the advancement of the
Art and knowledge of the Bee; yet not with that
felicitie and happinesse whicb this Gentleman hath
attained unto, to whom I cannot chuse but allow all
possible.

possible praise and estimation ; confessing ingeniously
that I haue not read or seene any worke of this
Nature more exact and compleat then this is. And
howsoever others haue, or may adde more words,
more quaint devises, and more amazing Meanders,
yet the substance of the Art, and the excellent things
which are meet to enrich and adorne every good
mans knowledge, cannot be better or more fully
discussed : for here you shall know what the Bee is,
his breeding and government, how to order him,
house him, and maintaine him, how to remove him,
purge him from injuries, and to preserue his health,
of swarming, driving, hoysting, and destroying
things superfluous. And lastly of their profits, and
how those profits are to be disposed, and what ac-
commodations are necessarie for the support and
encrease of so usefull and delicate a commonwealth.
And he that in this Art will looke beyond this, let
him looke beyond the Moone, I will neither lend him
mine eyes nor my commendations.

Your Admirer

GERVASE MARKHAM.



I. S. ad lectorem.

For profit, pleasure, policy, and fame,
High pregnant wits themselves have lost to finde,
But couched here lo under Levetts name,
These vertues grave, flow from his godly minde :
Athenians looke for news of other kinde,
Fables not truth, their fancies for to feed,
Sure vertue is news, who is so her inclinde,
Vertue is gone Macenas being dead.

From Court and City to the Country fled,
Obscure she lives amongst her rurall friends,
Thence by her beames are little Bees discried,
Their wit, their work, their policy and kindes :
But pore not much upon this regall race,
Lest ere you know, they sting you on the face.

Idem.

Non quantum sed quale, Iovis primordia parva,
Rebus in exiguis grandia saepe latent.



S. Purcas.

VNskild am I to usher forth thy Book,
Or blazethy selfe with termes of commendation,
(Nor busie Bees such idle court sies brook,
Nor can I rules queint affected fashion.)

Tby selfe,thy selfe enough, enough thy Booke,
Tby Book commends, and I, my Levett, leave it,
Here in small Bees, Gods greatnesse first I looke,
And then thy selfe though dead to live yet.

Industrious Fly, fly forth, and sound him farre,
Which here sounds thee, thy nature, art, thirst, keeping,
Much can he prayse thy peace, and much thy warre,
Modell of policy, a sweet good seeking :
And in those lazy Drones thy sting fix sure,
Which nor their own, nor others paynes can dure.



Idem ad I. L. Editorem hujus libelli.

VELL hast thou shewed the world thy fathers worth,
*(As by the foot is known in Symetry
The body whole) when thou this Book sett' st forth,
Iust witnesse of his wit and industry.*

*And though he never sipp'd at Hipocrene,
Nor clymb'd Parnassus top, he well devised
Of Mathematicks, (which no Academe
Him taught) but studious paines, and time high prised.*

*Of policy of States, of peace, of warre,
Of natures art, plants, planting, lands to measure,
Of Histories, times, places, neere and farre
Off; oh, but death hath rob'd us of this treasure:
Earth hath his earth, heaven his heavenly part, his name
Thou here intomb'st while Bees there be in fame.*

Nos quoque nostra A. Cook.

Let Bees be praysed by that Latian Bard
That sweetly sang their occupation,
(Enriching with his song, his song-rich nation,
Himself with never dying fames reward.)

While thee we prayse with hearty loves regard,
That hast set forth this sweet Flyes operation,
With Maro's skill, though in another fashion,
To thee thy Countrymen like fame award.

Oh had thy Countrymen enioyd thee still,
How many choise fruits had they reapt by thee,
Which now death envies to posterity,
What art-surpassing drops did heaven distill
Into that graden where this plant did grow,
And thousands more which natures hand did stow?

The winged Citizens of mount Hymete
(Forsaking once their flowry mansion)
Flew down to Athens laden with sweet meat
For infant Plato's mouth to feed upon.

There did they turn his cradle to a hive,
And gently buzzing, harmlesse busses gave him,
Thereby presaging that his name should live,
And that his wisdome from to dy should save him.

I saw a swarm descended of that stock,
Fly to our Authors tomb, from whence proceeds
This posthume birth conceiv'd of heavenly seed,
I heard the humming of that airy flock,
Mourning his death; then swearing on this book,
His fame as they should dure, their flight they took.

L. M. utcunque P.



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FINIS.

S

J



A
DIALOGUE
CONCERNING
THE ORDERING OF
BEES.

Tortona.

Petalba.



Ortona. Well met good neighbour *Petalba*, but whether away so fast man, thus early in the morning? I suppose your busynesse is important, you make so much haste.

Petalba. O I cry you mercy Sir, I saw you not before you spake; in good sooth I was even comming to you, my friend and kinsman that was, *Philippo Ambrosia*, having (as you know) made me his Executor, amongst some other things, hath left me some eight or tenne Hives of

A

Bees,

Removing of Bees.

Bees, which at the first I made small account of, but after my businesse of greater regard was over, I beganne to looke over his Bookes, amongst which I found these discourses or Pamphlets concerning the ordering of Bees: whereupon I began not onely to consider the profit reported to arise and come of them, but also to take especiall delight, as well in their order and government, resembling the forme (if they report the truth) of a most exquisite and well governed Common-wealth, as also admired their notable arte and industry, in framing of their combes, gathering of their honey, and other labours and great travailes to maintaine and preserve themselves and their Brood.

Tortona. Good neighbour Petralba, there is no man more welcome unto mee then your selfe, and I am very glad that any cause hath made you to take pleasure and delight in Bees, because my selfe as you know, doe also the same. For by this meanes I shall have a companion to converse withall: for according to the old Proverbe, *simile simili gaudet*, and that may communicate with me in the same pleasures, and so make them the more delightsome unto mee, which for want of conference with such as take pleasure in the same, seeme often wearisome and irksome unto me. And to talke of Bees to those that love them not, is like musicke out of tune, or a pleasant tale told to the sorrowfull. But wherefore doe you bring your Bookes with you?

Petralba. Marry Sir, although my Bookes have stirred up in me some affection towards Bees (as before I said) and have somewhat informed me of the manner how to use them, at the least in my conceit, yet knowing your great practice and long experience amongst Bees, with the plentifull increase, and profit that I suppose

pose you make of them (by that little that I have read of the profit of Bees) I made bold to conferre with you first, before I put in practice any of those preceps that are taught in these my bookes, and for that cause I have not stirred nor meddled with them as yet, untill I might perceive how your opinion agreed with their writings, or disented from the same, and this was the cause that I brought my bookes with me. Againe, my purpose is shortly to remove them to mine owne house, if you think the time fit and convenient for the same.

Tortona. Concerning the time fit for their remove, i will tell you my opinion hereafter, but first let me know whose works those bookes are that you have brought with you.

Petalba. The one is that which we commonly call *Googe his husbandry*, who amongst many other preceps of husbandry concludeth his worke with a Dialogue of the ordering of Bees: the other is a Pamphlet set forth by one Master *Southerne*; to the same purpose I have also seene a booke called the Country Farme, lately set forth, wherein also there is somewhat said concerning this matter, I make no doubt but you have seene them all.

Tortona. Yea verily I doe know them well: the first of them is principally a short collection, gathered out of the works of sundry learned men that have long since written of Bees: as *Aristotle, Virgil, Varro, Pliny, Celsus, Columella, Didimus, Dionysius, Thaseus*, and others: rather then any great knowledge or experience that himselfe seemeth to have had in the ordering of Bees. But the other is onely certaine practises and experiments gathered by his owne observations, by long keeping of Bees as himselfe confesseth. Both which workes no

doubt are worthy of commendations, and have profited many, yet neither the one with his authorities, nor the other with his experiments doe so fully intreate of them, but that much more may be added, and many things also are alleadged by them, which for mine owne part I cannot approve, but do hold them altogether impertinent or dangerous.

Petralba. Surely my selfe imagined no lesse, and because I am not able to distinguish the good from the counterfeit, I was desirous to conferre with yqu (as I said) before I meddled with them.

Tortona. You must understand before that you remove them, it shall not bee amisse for you to observe three things. First, the fittest time for their remove and the manner how to doe it. Secondly, a place convenient and good for them to stand in: and thirdly, the order and manner how to place and set them. Now concerning the time of their remove, I hold it not much materiall so it be carefully, gently, and quietly done, with as little stirring them as may be; yet doe I thinke the best time to be betweene the moneths of *January* and *May*, having especiall care to keepe them as much from the ayre and cold as is possible, which will doe them much hurt at that time of the yeere. And the worst time of remove I hold to be betweene the beginning of *May* and *November*, for at that time of the yeere they are either full of Bees, or else heauy with honey, and by that means are apt to take hurt by much troubling the Bees, or stirring and breaking the Combes, and consequently of spilling and spoylling their honey. But for Swarmes the best time to remove them, is as soone as may be after they are swaimed. And concerning the fittest place to set them in you are well informed in your booke, name-

ly, in some Garden or Orchard or other severall place, free from cattell or much resort, if it may be, for they are great lovers of quietnesse, and hate the contrary: againe, it were good they had the South and West Sunne open unto them, but if they be defended from the East and North, it is much the better, be it either by pale, hedge, trees, housing, or such like. You must also observe that a hill or mountainous place is not good for them, because they will be the more subiect to stormes and wind, which is very hurtfull and perillous for them, and doth exceedingly hinder them in their labour.

Petalba. Master *Googe* saith, that the place of their standing would neither be to hot nor to cold, but as temperate as may be, so as they be neither offended with the cold of Winter, nor the heate of Summer.

Tortona. In more hotter regions, as in *France* and *Spaine*, I am of their mind which so affirme, yet could I never perceive that Bees were offended with the heate of any place that ever I could see in this Country: provided that their Hives be well coated (as I will after shew) to defend them from the heate of Summer and the extreame cold in Winter, for otherwise the extreame heate of the Sunne in the Summer may melte their Combines, and cause their honey to runne out, as many times I have scene amongst my neighbours Bees, where provision hath not beeene made to prevent it. And againe the extreame frosts in Winter will so benume them, as they being pinched therewith, will fall out of their Combines and presently dye; and all for lacke of warme keeping of them: both which extremities may bee prevented by one remedy namely, by the coating of their Hives, as after shall bee declared.

Petalba. Well Sir, now let me have your opinion concerning the manner of placing or setting of them.

Tortona. Touching the manner of placing of them, Master Southerne hath written very well, and therefore I will dissent from him very little, because I hold his Judgement the best therein of any that I have read. And first to begin with all, I would have every Hive placed upon a severall plancke board or stone, within two foote of the ground at the most, for so the winds will have the lesse power over them at the entrance into the Hive. And the plancke, board, or stone whereupon the Hive standeth, must be some three or foure Inches at the least broader then the Hive on the South part, where the hole or mouth of the Hive must be, for so the Bees shall have roome to light upon it, before they creep into the Hive, and I hold it best that the South part of the plancke board or stone, should stand somewhat lower then the North part, for by that meanes no water, snow, or hayle, can runne into the Hive but will presently fall off againe as it melteth. Lastly, let the upper part of the mouth of the Hive bee but a little distance from the board, least Snayles, Myce, or some other vermine creepe in, to the great danger and hurt of the Bees; nevertheless you may let it be some three or foure inches broad in the Summer time, or else they will want convenient roome, to goe in and out at their pleasure. But round about the Hive, except at the mouth let the Hive be dawbed up close, with Clay, Cow-dung, or Morter, or rather a mixture of the two former with Ashes or Sand.

Petalba. In every place where I travaile (except with you) I see them set upon a plancke, or board, almost close one to another, wherfore then should you

place every one upon a severall board, which, as I think, requireth much more planck or board, and also many stakes, with a great deale more labour.

Tortona. I confesse, the manner you speake of is most usuall, especially in this Country, but how hurtfull it is, might easily bee perceived, if those that use it would diligently observe the same. For at some times by standing so neere one another, they will undoubtedly infect one another with their smell, especially when any infection or diseases happeneth amongst them, as many times there doth. Secondly, they will bee the more ready to run one to another, and fight, and by that meanes the weaker are often oppressed by the stronger : Againe, their neernesse will hinder one another in swarming time, and when they do labour much. And lastly, their coats cannot be taken off and on, as occasion shall serve. And whereas you object, that it will spend more planck and board, that is not so, for the planck or board, need be no longer than the breadth of the Hive, only it must be wider, and so it must be the other wayes : now for a few more stakes, and the greater paynes, it is not worth the speaking of, considering the benefit that will arise by it, prove it who that will.

Petralba. But do you hold it of necessity that the mouth or hole of the hive must stand towards the South?

Tortona. No verily, I would not have you take mee so, yet do I hold it absolutely the best, both because the Bees delight chiefly to fly that way, as also it is the hottest ; and the South sunne in his heat will cause them the readier to swarne : Nevertheless, I have seene some stand towards the West, that have done prettily well ; but to the East, I hold it not good, and to the

North,

North, much worse; because those winds are most cold, and the Sunne hath least power upon the hyves that stand with their mouthes that way.

Petalba. Mr. Southern holdeth it not good to place them neare a river, or great pond, if it bee on the South part of them, because (saith he) many of them will fall into the water, especially in windy and tempestuous weather.

Tortona. If the river or pond bee very neere them, it is true, but if it be any distance off, as some furlong, or quarter of a mile, it mattereth not much, for then the Bees will fly high out of the danger of the same. Marry this I know to be especially good, to pare the ground under and on the South side of them, some foure or five foot off, so that no grasse or weeds may grow thereon, or else keepe the grasse very short, because if the winde beat them down, they will get up much the sooner: againe, mice, toads, ants, and wormes, will the lesse resort unto them to hurt and annoy them, because they shall finde no covert or shelter there to hide them in.

Petalba. I thinke you sayd that you would have them stand privately, as farre from noyse or much resort as conveniently may be, what should be your reason for that?

Tortona. I did say so indeed: for Bees of all other creatures can worst away with any great noyse, especially in the winter time, or in the night, for then they doe for the most part continually sleepe.

Petalba. How farre doe you thinke it convenient that one hive be placed and set from another, without danger of annoying his neighbour hive: and what forme would you observe in the placing of them?

Tortona. I like best the setting them in rowes from East

East to West, and being placed in that manner, I think if there be a foot, or halfe a pace between the outsides of the hyves, that is enough: although where there is plenty of roome, it shall not bee amisse to set them a yard asunder. But if you shall be constrainyd to make more rowes than one, in this case you must place South and North at the least some fifteen or sixteen feet asunder, before or behinde the other, both to have sufficient roome upon any occasion to go between them, as also to prevent any hurt that may happen amongst them, by their over neernesse, in their going out and in. And thus much I think is sufficient to instruct you, what shall bee needfull to be done concerning the removing and new placing of your Bees.

Petralba. But all this while I have heard you say nothing, what house or defence were fittest to bee made for your hyves, to keep them from wind, raine, and cold of the winter, for I cannot imagine that it were good to let the hyves stand bare and naked to the extremities of our cold winters and violent stormes.

Tortona. No, nothing lesse, for assure your selfe, the well defending them against the extremities of heat and cold, is one of the principall meanes of their welfare and increase, and therfore I will at large declare my opinion, which way I take to bee the best to defend them from the wind and weather. In many places (as you know) they use to make pentisces or low houses covered with board, thatch, or tyle, and so set them upon plancks under the same, which indeed kcepeth them from the raine, but neither from the heat of summer, nor cold of winter, for the hyves standing naked, the heat or cold easilly taketh hold of them, especially any great and long frost. Againe, the winds many times maketh a great

noise in the hollownesse of these kinde of houses, which sore annoyeth the Bees in their rest. And therefore with Mr. Southern I utterly mislike those kinds of houses and pentisces, as unprofitable and hurtfull unto Bees ; yea I may boldly say, I never saw any great store of Bees where they were kept in such houses. I will therefore shew two manner of Coating or Covering of hives, the one of Mr. Southern's invention, the other of mine owne ; so that you may accept of which you like best ; for either of them will serue for that purpose very well.

Mr. Southern's way is this, upon some rainy day, when the Bees are all at home, stop them up close, thrusting in a little quill to give them ayre, but not to let them come forth, for troubling you and themselves ; then take sand & Cowdung, or clay with Cowdung, tempered well together, and amongst it temper good store of straw cut very short ; then take wheat, rye, or barley straw, and lay a good deale of it upon the byve, and upon that a good thicknesse of the morter aforesaid, and fasten it on, so hard as you can with a trewell, and so let it stand ; then with a payre of Taylors sheeres or other sheeres, cut away the strawes that hang to low, round about the hive, and when the morter is dry, you may take it off or on at your pleasure, and it will hold well together, and not breake, one of these (as saith Mr. Southern) will last two yeeres.

Now those of mine owne invention, I make thus, with wheat or rye straw only, without any dawbing at all, in this manner ; I take a pretty handfull of straw, and towards the one end I bend it up againe, and there, within foure fingers of that end, I tie it fast with rope-yarne, or good Elme peeling, then do I take another handfull, using it as before, and tie it fast to the other with

with a single knot between them, and so tie handfull after handfull, untill it will reach round about a hive: then do I tie the first handfull fast to the last handfull, and put it upon an empty hyve, which I have of purpose ready by me; and when the lower end that is so fastned together, is within some six inches of the ground, I gather all the upper ends of the strawes together, and tie them all fast together right above the crown of the hive, and as nigh it as I can, and then cut the strawes away a foot above the place where you last tied it above the crown of the hive, and if any loose or short strawes stick out, cut them away with a paire of sheeres or such like. And thus can I make as many as I list, and afterwards at my pleasure in an evening or morning put them upon my hyves without troubling or molesting my Bees at all. And if the lower end of my Coat comenere the planck or board whereon my Bees stand, as sometimes they will do, I cut away the straw right against the mouth of the hive, for troubling the Bees in their passing out and in.

And these kind of Coats will hold out raine, and keepe the Bees both from the heat in the Summer, and from the cold in Winter: and are done with little or no cost, but onely a little paines taking twice or thrice in the yeere to renew such as decay, or to make new for the swarmes in swarming time, for once or twice a yeere at the least these must be viewed, and some of them amended or renewed as need shall require.

Petalba. Although these Coats or coverings which you teach the making of, will defend the Bees as you say from the raine, heate, and cold, yet me thinke Mice, Flyes, and other vermine should have great meanes to hide themselves, yea and to breed also under them:

which must needs be very perillous and hurtfull to the Bees, as both your selfe and all others that write of them confess.

Tortona. It is out of all doubt, that without looking unto once or twice in a moneth, it will fall out as you say: for no commodity is without his discommodity, and therefore to auoyd that, you must as I said before, sometimes lift up, or else take of their Coats, to see if any such offensive vermine be there, and to drive them away or kill them if it be possible, and also to looke that it be not perished, so that the raine may runne in and hurt the Hive, for whosoeuer will haue profit and commodity of Bees, must overlooke them many times, and be viewing and repairing their wants as need shall require, because they require much more diligence, paines and industrie, then either expences or cost. Notwithstanding to thole that loue them, it is rather to be tearemed a pleasure and delight, then any irksome or laboursome toyle at all, for what is it to spend a quarter of an houre amongst them once or twice in a moneth or sixe weeks, to overlooke them: which will serue although you had halfe a hundred Hiues.

Petalba. I doe not perceiue that they need any great paines, and that may be done at idle times for the overlooking of them. But one thing I must aske you more concerning their remoue. I find them now close stopped up, except one little hole to the South not much bigger then will suffice for one Bee to come out at. When I remoue them shall I stop them up so close againe?

Tortona. If you remoue them before the latter part of March, stop them up againe as close as you found them, but after that time, whether you remoue them or

nor, open their holes or mouths by little and little, vntill it be mid Aprill or toward the beginning of May, forby that time you may open them as wide as shall be needfull, namely, as I haue said elsewhere, some foure Inches at the least.

Petalba. Why may I not open them as wide as need shall require at once, rather then to make so many workes of it?

Tortona. You may doe so if you please, as many others doe. Yet me thinke reason shoule teach you, that as a man or woman hauing long time kept house and beene out of the ayre, if at their first comming abroad, they continue long therein, or be in a place where much ayre commeth, it will much offend them, and therefore such are wont, by little and little to accustome themselues, to the ayre: cuen so, to let much ayre come into the Hives upon a suddaine, at that time of the yeere, there then hapning after many cold blasts, it cannot be but with great danger to the Bees, especially if they be weake or feeble (as my selfe haue often seene) for a little thing helpeth or hurteth them at that time of the yeere. Againe at the time when you begin to open them, or within a while after, lift them easily cleane up from the board whereon they stand, and scrub and sweepe away all the filth and sharings of Combines or other things that you shall find vnder them, and then set them downe gently againe, for so shall they haue the more pleasure to labour, and to repaire their Combines, those noyous and filchy things being taken away.

Petalba. What if some of my Bees be poore and weake in the Spring time, shall I not feede them, or doe somewhat else to cherishe and relieue them?

Tortona. Master Souborne doth utterly mislike the feeding

feeding of Bees, and alleadgeth some reason against it, namely, that old honey will make them to scowre and dye, or else the vse of feeding will make them fall to robbing, and some other reasons which for mine owne part I cannot absolutely allow. For I haue scene Bees euen almost dead reuiued againe by a little feeding. Truth it is, it must be very warily done, and not often vsed but in an extremity. And when necessity shall constraine to doe it, you must take especiall care that the other Bees come not vnto them, and therefore you must stop them vp sauing a little hole to giue them breath, for otherwise the stronger Bees will fight with them for it, and not onely get it away but will kill them for it. And yet I must needs confess that in the beginning of the Spring I haue scene more hurt then good come by feeding of them. But this I haue both scene and proued, that when in the latter end of May, or beginning of June a cold and Easterly wind hath continued long, or some continuall rainy weather hath hapned, the Bees haue first brought out the Drone spat, and after that their owne spat: and lastly if it bath continued, haue died themselues.

In the yeere 1600, betwenn the 17 of May and the 6 of June, I had twelue as goodly swarmes as euer I saw, and then there hapned a dry and cold East wind, that my swarmes for the most part perished, and my other Bees also hauing brought forth their brood or spat, began also to die themselues, which I espying (by the great number I might see dead on the ground at the mouth of the hive) did a little feed them in the euening, and mornings, and it did presently strengthen them, that no more died. And euer since at that time of the yeere, I do diligently obserue, that when I see them begin to bring forth their spat, being forced thereto by

any cold and dry weather, presently to feed them, as I haue taught you ; and whereas for the most part euery yecre since about that time, such a like cold hath hapned, yet by this meanes I haue preuented the danger that would haue falne upon my Bees. But to feed them in February, March, or Aprill, is surely to no great purpose, without a great chance.

Petralba. Is there no course to be taken at the beginning of the spring, for the help and strengthning of such hives where the Bees be poore and weak?

Tortona. Mr. *Southern* affirmeth that if about the latter end of March, you perceiue the Bees in any of your hives to be faint, and that they go but slowly out and in, it is good to buy some *Olibanum* at the Apothecaries, and take a little of it bruised in a morter or such like, and sprinkle it upon a chafing-dish of coales, and then hold that Hive of Bees ouer it, that the smoake of the *Olibanum*, may ascend vp into the Combes amongst the Bees; and it is, saith he, much the better, if a little dried Cow-dung bee mixed amongst the *Olibanum*. This he constantly affirmeth will make them abide the sharpenesse of the weather the better, and will strengthen them very well. One groats worth of *Olibanum* he saith will serue forty Hives, if need be. But how good it is for that purpose I never yet made tryall, nor any that ever I could learne, yet do I hold it very probable and likely to do good. The Bees being quickly set down againe, and well closed up; for this I forgot to tell you when you begin to open the mouthes of your Bees, if they be weake, open them the lesse, and if strong, you may be bold to open them the more.

Petralba. Well Sir, I suppose I am now sufficiently instructed how to order my Bees in their remoue, and

after the same vntill the spring of the yeere, or beginning of May. I pray you let me also understand what is further to be done, for then (if I mistake not) beginneth the chiefe and principall time of their breeding, with the exhortance of increase and profit by them.

Tortona. It is very true, and therefore you must at this time (if not before) prouide hives, plancks, board, or stones, and all other things necessary for the receiuing and keeping of those swarmes that you may probably expect.

Petralba. I haue scene (as I remember) some hives wrought with osyers, or woodbind, or such other like stiffe, and dawbed on the outside with Cowdung and ashes mixed together, but of late dayes I haue seen most of our hives made altogether of straw, whether of these two fashions do you hold the better?

Tortona. Diuers countries haue their scuerall fashions, as well for the matter whereof they are made, as also for the manner and forme of their making. But in our country (as you say) the hives made of wickers or of straw are principally in use; but whether of them is the better I will not peremptorily determine, because I have scene Bees prosper and increase well in both: and I hold it not a materiall part of the well ordering of Bees, to use the one or the other, yet do I like best those of straw if they be well made, as the warmer and most agreeable to the nature of Bees, for we see that humble Bees, Waspes, and other Flyes (whereof no doubt these are a kind) preserue themselues all the Winter, onely in the warmenesse of straw, as in thatch and such like.

Petralba. Is there then such difference in the making, that you so much preferre the one before the other?

Tortona. Yea verily, and I had rather give seuen pence a peece

a peece for some, then four pence a peece for other some, and yet are the best commonly as good cheape as the worst.

Petalba. How then shall I know them asunder, for I am like enough to buy the one as soone as the other?

Tortona. You shall easily know them asunder, for the goodness will soone appeare in the fast and well binding of them, and in their good and handsome forme and fashion. For if they be loose and thinnely bound, they will not last, and besides that, when they are laden with honey, the weight of it will presse downe the crowne of the Hives, and so marre the Combes and kill the Bees. Of strawen Hives the best that ever I saw are made in *Suffolke* and *Norfolke*, were it not, that they make them for the most part somewhat to great.

Petalba. Doe you not like great Hives? me thinke they should be the better, because they will hold good store of honey, and the Bees have the more store of roome to worke in, and therefore should cast the greater swarmes.

Tortona. It may peradventure seeme so indeed unto many, but experience and proofe doth declare the contrary, and therefore in any case avoid the buying of great Hives as hurtfull to the increase and prosperity of your Bees. For I assure you, I did never in my life see a great Hive yeeld any good increase, or almost come to any good: for if you put into a great Hive a swarne that is little or that swarmeth late, the roome is so large that they cannot any thing neere fill it the first yere, by meanes whereof so much vacant place remaineth empty, that it maketh all the Hive so cold in the Winter time, that it is great odds if it die not. And if you put in a forward swarne that is great, yea though it be a

duble or treble one (as often I have seene) and that it fill the hive, yet will it seldom or never cast any swarms, as experience hath taught, and the reason seemeth to be, for that so much labour is spent in repairing of their Combcs, renewing their brood, and filling so great a space with necessaries, that they cannot, or need not send forth any Collonies, but have enough to doe, to keepe and furnish their owne.

Againe, let not your Hives be over broad especially at the Crowne, for in such Hives Bees doe not delight, and therefore I had rather have my Hives high so they be narrow, then broad although they be short. And thus much I suppose is sufficient for the choice of your Hives. I know that many preferre the Hives that are made of Wheat straw, before those made of Rye straw, as best liked and agreeable to the Bees, yet I could neuer perceiue any great difference for that matter, but like them as well as the other if their making be alike.

Petalba. But yet me thinke that the Hives made of wickers should be much more profitable in one respect, because it must needs be granted that they will continue longer then those made of straw.

Tortona. Surely if the straw Hives be well made as I have seene some, and withall well preserved from the weather, namely, from the Sunne and Raine as before is taught by coating of them, they will last many yeeres, and I thinke verily as long as the wicker Hives, and also they haue another commodity, for they are not so deare as the other, yet is all this nothing to the benefit that will grow if your Bees prosper well.

Petalba. When I have provided them according to your direction, what then shall I doe to them, for I haue seene some put stickes into their Hives fastned to both

both the sides which I judged they did to keepe the Combcs, from stirring or falling out of the Hives.

Tortona. You guessed rightly, for to that purpose they serue indeed. But first when you haue bought and provided your Hives, you must with a knife or paire of sheers picke and cut of all the strawes ends that sticke out within your Hives, and make them as smooth as is possible, for the Bees will like them much the better. Now concerning the sticking of your Hives, sundry men haue sundry fashions according as they conceit or like the same. But if your Hives be of straw, I hold it good that you make a Crowne tree for them in this manner. Take a sticke of Sallow or Hasell about the bignesse of a mans thumbe, let it be a foote long or somewhat more, then cleave it crosse wayes from one end untill you come within a handfull or thereabouts of the other end, and no farther: then bend every quarter a severall way, cutting off the sharpe edge in the midst of every of them: Then must you put the end that is not cleft to the crowne of the Hive, and bending every of the parts a severall way, sticke them into the sides of the Hive, that they may force the upper unclift end hard to the crowne of the Hive. But if the Hive haue a little hole in the crowne (as the most straw Hives haue) then cut the upper end of your said crowne tree where it is not cleft small enough to goe thorow it a little way, leaving a shoulder on the inside to stay it and this is good to keep the crowne of Hives from sagging downwards (as they will doe except your Hives be excellent good) when they are heauy laden with honey, but this you must obserue, that if you put your crowne-tree through the crowne of your Hive, you must make it somewhat the longer as experiance of it selfe will teach you. Lastly,

take a smaller stick, and cleave it cleane through in the midst, cutting both the parts flat and smooth, and put them crosse wise into the hive, within foure fingers of the board they shall stand upon; and this is all the sticking that shall need for any hive, only this you must note, that the four lower ends of the crown tree should come and stick within halfe a foot at the least of the lower part of the hive.

Petalba. Do you not usually dresse and trim your hives with some hony, or other sweet liquor, before you put any swarm into them?

Tortona. It is a common matter so to do indeed, yet if the hive bee new and sweet, I hold it not materiall to do any such thing, but the Bees will like it well enough without it. Neuerthelesse, because it is a thing that may help those that bee old, and somewhat unsauory, and cannot hurt any, I will shew you what my selfe and diuers others use to do in this case. Gather some fennell, mallowes, or other sweet herbs, and dip them in fayre water, drinke, or sweet wort, putting a little hony into them, if you haue it, and sprinkle or rub well the inside of your hives and sticks, or if you haue no hony, do it with any of the former, or with milk that is sweet, and it will suffice. But this kinde of dressing would not bee done untill you are ready to put the swarme into it, or a very little time before.

Petalba. Mr. *Southern* saith, that if your Bees bee froward, so that they will not tarry in any hive, then it is good to take your hive whether it be old or new, and pull out the sticks, and put therein two handfuls of barley, pease, or mault, yet the last (saith he) is the best, and let a Hog, Sow, or pig eat it out of the hive, turning the hive as hee eateth, with your hands, that the froth hee maketh

maketh may remaine on the hive, then wipe the hive lightly againe with a cloth, and put in your sticks as before, and hive your Bees againe, and they will undoubtedly tarry in the same, as he saith.

Tortona. True it is, he affirmeth so indeed, but whether it be so or no, I know not, because I never made any triall thereof, for I never had any swarne that I could not make take liking of one hive or other that I had by mee, and therefore I never trouble my selfe to make triall of Mr. *Southerns* experiment ; yet do I beleue that hee would not so confidently haue written it without some good proofe, and also the knowledge thereof, if it be true, is worth the noting, and the triall also if occasion serue : and thus much I hold sufficient for your instruction in the dressing and trimming of your hives.

Petalba. Well Sir, I thank you for your paines, I woulde now intreat you to let me understand about what time of the yeere I may in likelihood expect swarmes, because of giuing attendance and watching of them, as I beleue we must in swarming times.

Tortona. Concerning the time of the yeere when Bees accustomably begin to swarne, there can no certaine rule bee giuen, because the forwardnesse of the Spring, warmnesse of the weather, and businesse of the Bees may make them swarne much sooner than otherwise they would do. Yet do I hold it good to haue all necessary things ready by the midst of May at the farthest, if not before ; for then every day you may probably looke for swarmes, if the other circumstances be fauourable ; and therefore you must from that time forwards, so long as their swarming time indureth, diligently watch and looke unto them. Now concerning the u-

sing of your swarmes, thus much ; when any hive beginneth to swarme, haue a good eye upon them where they light or settle, yet so that you trouble or molest them not, with running to and fro amongst them : and when they are settled, take your hive made ready as you are taught before, and put them into it in this manner ; If they bee settled upon the bough of a tree, bush, hedge, or such like, that you can put your hive under them, lay first a fanne or board right under them, with a stick or twaine upon it, for keeping the hive that it stand not too close unto it, so that the Bees cannot go out and in, and then turne your hive upward, and shake as many of the Bees into the same as you can, and set it gently upon the said board or fanne, and spread a sheet ouer the hive, to keep away the heat of the Sunne, yet so as some one place be open for the Bees to finde the way to the hive, and to work and make cleane the hive. But if any of them cluster againe about or neer the place from whence they were shakēn, shake them off againe, or else sweepe them off with a wing, and lay Mayweed or wormwood about the place, and they will forsake it, and follow the rest of their fellowes into the hive. But if your swarm light so low in a hedge, or such like place, that you cannot put your hive under them, nor shake them into it, nor sweep them into it with a wing, then may you set your hive over them, so that it touch the upper part of them, and by laying Mayweed or wormwood under them, and about them, you shall make them run up into the hive without any other trouble, still following them with the Mayweed or wormwood, as they go up from it, though peraduenture it will bee somewhat long ere they be all gone up, yet they will go up at the last, without stirring.

Petalba. In some places I haue seene, that they would not hive their swarmes untill late in the euening, and me think it should bee a very good way, for at that time there is not so much danger of stinging, as in the heat of the day, as also they will bee then hived very quietly.

Tortona. By that meanes they are in danger to lose many swarmes ; for I haue many times seene swarmes that haue settled themselues very well, and within an houre or two after, for want of hiving, haue gone back againe to the hive from whence they came, yea, and sometimes haue taken their flight cleane away, which might haue been preuented in time, if they had presently been hived. Again, where there are store of Bees, there will somtimes happen three, four, or five swarmes in a day, and within a very small time one of another, if they should not bee hived soon after they are settled, they would go all or the most part of them together, which sometimes can hardly bee preuented, do the best a man can.

Petalba. But all this while I heare you speak nothing of the ringing of basons, or such like, which I haue often heard when a swarme is up, or in rising ; it seemeth you are of Mr. Sontherns mind in that thing, for hee seemeth to mislike it much.

Tortona. Yea verily, for it is a very ridiculous toy, and most absurd inuention ; and I assure you, if it worketh any effect, it is rather hurtfull than profitable to the Bees. For as I said before, all great noise doth undoubtedly disquiet and hurt them ; and so farre am I from thinking that it will hinder them from flying away, that I verily beleue it may be a principall cause to make them go away the rather, besides other hurt in

disquieting of them, which maketh them fierce and waspish, for my selfe haue had aboue forty swarmes in a yerie, and haue not lost one of them, when my neighbours having a farre lesse number, and using this kinde of ringing and jangling, yet haue lost diuers.

Petratba. I heard you say, that when diuers swarmes arise together, or presently one after another, namely, before the other be hived, that it is ods but they will go together : what meanes haue you to prevent that ?

Tortona. The best way is, not to suffer two or more swarmes to arise together, and that is done in this manner ; as soone as one swarme is risen or rising, mark well your other hives, and if you see any begin to swarne, take a table napkin, or other cleane linnen cloth, and stop up the mouth or hole of the hive as close as may be, laying a brickbat or stone upon it, untill the other swarne bee put into the hive, and all quiet : then pull away the cloe, and it will presently swarne, or within a very short time after. And thus may you let them out one after another, at your pleasure, though you have halfe a dozen that will swarm in a day. And if you use not this meanes, when one swarm ariseth before the former is cleane hived, you may do thus, (for if two rise together, there is no help except they part of themselves, which is very rare.) But in the other case, when you see the latter swarm go to the former, and are almost lighted about and upon the hive, and that there is a good part of the former swarm gone into the hive, take that hive cleane away as secretly as you can, and carry it some eight or ten rods from that place at the least, first having set an empty hive where it stood, and often times I have scene the latter swarm go quietly into it, and haue both done very well, yet sometimes they will finde out one another.

another, and go together do what you can. And that I take to be when all the master Bees happen to go into one hive, so that the other hath none, without whom (as I think) they cannot live and prosper, but of that I will speak elsewhere, when I shall declare the manner of breeding and government of Bees.

Petalba. Mr. *Southern* seemeth to mislike the having many swarmes of one hive; what say you to that?

Tortona. That hive which hath cast mee one good swarm, I acknowledge to haue done well for that yeere; yet although it yeeld me another, the stock may do well enough, but the last swarm is in hazard, except it happen soone; but if a stock swarm three or four swarmes in a yeere (as sometimes I haue seene) both the stock and the latter swarmes are all in great danger to die the next winter, except you put two or three such swarmes together: and for the stock, the best way is, to drive it at Bartholomew tide, for in moist summers you shall haue some hives will almost swarm out all their Bees, as my selfe haue had.

Petalba. Will Bees swarm most in moist and wet summers?

Tortona. Yea, without all question, and thereof commeth that prouerb, that in moist yeeres there is plenty of Bees, and in dry years plenty of hony; yet may there be good store of both in one and the same yeere: for if May and June prove stormy, you shall haue plenty of swarmes, and if July prove dry, you shall haue good store of hony.

Petalba. What doe you thinke shoulde be the reason of this?

Tortona. Experience doth proue it to be so, yet I take the reason to be, for that the Bees both spit faster and

preserve and nourish their brood the better, by the moisture that falleth in those times, which in dry weather they cannot so well get, except such as is in part corrupted being mixed with other waters. And this I take to be the cause that Bees will come abroad so fast presently after a storme of raine, and againe want of raine and dewes at that time of the yeere maketh them to loose their brood as I have before declared.

Now for honey it is out of all doubt that there is never any store untill July, or towards the latter part of June, and without question drie weather is best for that, Because it is nothing else but a gummy and thicke dew made by the influence of the Starres, or rather caused by the providence of the divine power, for the profit and delight of man falling from heauen at that time of the yeere, (being digested and made perfect by the nature of the Bees (created for that purpose,) which stormes and raine will dissolve and wash cleane away: And this is so apparent that every man of any observation may manifestly perceiue. For when there is greatest store of honey, so that it is sensibly to be felt upon leaves and flowers, if there happen any great storme, or raine of any continuance, presently after there will bee no such thing perceived, but it will be cleane gon and washed away. Againe, marke the Bees when they gather honey fastest (as may be perceived easily in the morning, by a deaw and moysture, that will bee at the mouth of the Hive and also by the great smell of honey if you come neare in the evening) yet if a raine happen to fall of any quantity (as I said before) you shall see no such deaw the morning following, nor some two or three mornings after, although it be faire weather againe, untill the deaw being thickned and sweetned by the heat,

haue againe obtained the former quality, but of this more hereafter. See Southerne to take Bees out of a hollow tree.

Petalba. You spake of putting two or three swarmes together, I pray you how doe you that? For I have heard some affirme that they will fight and kill one another if they be put together, and can hardly be made to agree.

Tortona. It is then because it is unskilfully done, for otherwise they will either not strive at all, or else very little, and the manner is in this sort.

When you have a second swarne or castling (as some call it) put it into a Hiue as you doe the rest, and set it up with your other, and when you have another like unto it that you would put to it, Hive it also in a Hive by it selfe and so let it stand untill the evening; then at night when it is darke, take a Fanne or board and lay it by your first second swarne to which you would put the other, laying a small sticke or two upon it to keepe the Hive for standing too close to the board or Fanne: lastly, take your later swarne and carry it thither, and with your hand iumpc it downe upon the Fanne or board so hard, that all the Bees in it may fall out upon the same, then take your other Hive wherein your first swarne is, and gently set it over them, and the Bees will presently runne into it, but if any happen to creepe up on the outside of the Hive (as many times some will doe) with a wing sweepe them downe and they will runne into the Hive also: and so it being done when it is late in the night, there will be no great sturre or fighting, and by the morning all will be agreed and quiet. Whereas if you put them together in the day time or any other manner (that ever I could see) they will indeed fight and kill one another, to the great danger of them both.

Petalba. I promise you I like this manner of putting them together well, and I haue not heard of the like, but I pray you why may not the former swarm bee put to the later, as well as the later to the former?

Tortona. You may do so also if you please, but I like the other the better for this cause, peraduenture you shall not haue another second swarm sometime three or four dayes, or a weeke after your former, and by that time yont first swarm hath clenched their hive, and wrought some pretty store of combes, yea, and peraduenture gathered some hony also, which would be lost if you should put them out of their hive, to the other, whereas the other haue gathered little or nothing, beeing swarmed but the day before.

Petalba. That is very true indeed, you haue fully satisfied me for this. But I pray you, is it certaine, that by this meanes the Bees will live and prosper better than they would haue done, being in two seuerall hives?

Tortona. Yea verily, for all experience doth teach, that very few second swarmes will liue ouer a yeare, if they be not swarmed soone in the yeare, (which seldom or never hapneth) except you use them in this manner; by putting two or three swarmes together, and then they will do as well as a first swarne, although it bee great and good, as my selfe haue had good proofes and expeirience.

Petalba. But as I think, a few Bees should need but a little food, and many Bees much food, and therefore it shoulde not bee the number of the Bees that shoulde make them thriue or liue the better, but the proportion of the food they gather, according to the number of the Bees that are to liue upon the same, bee they many or few, whereas multitudes many times make scarcity, and
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bringeth danger to all the company.

Tortona. You haue some probability for that you say, but yet it is not altogether so in his case. For although it bee manifest that Bees cannot live without honey, which is their food, yet is warmth an especiall matter unto them in the winter, which is the onely time when they can suffer want; and therefore when there is a great companie, they fill the Hive or neere unto it, and so keepe one another the warmer: whereas if there be but few, so great a place remaineth emptie, and having gathered but little they easily take cold. Whereon the contrarie we see that many hands make light worke, so that such a multitude easily gather some good quantitie of waxe and honey to furnish the Hive, and to keepe them warme: and although many of them happen to die, yet some good number remaineth alive vntill breeding time. Whereas if there be but a few, and some of them die, the number remaining is not able to doe any thing, and so will either die also or else forsake the Hive.

Petalba. One thing I will here aske you while I remember it: doe you coat your Hives at this time of the yeere, or doe you tarry till winter time when cold weather approacheth?

Tortona. When you have any swarme that is set up, Coate it as soone as you can, for the heate of the Sunne may otherwise doe it much hurt, for although any great heate of the Sunne hurteth old stocks very much if they have no defence, yet doth it hurt swarmes a great deal more, and will make their waxe and honey to melt much sooner, as in all reason may easily be conjectured because their Combes are soft and tender, and their honey farre thinner then that in the old stocks.

Petalba. I have not yet heard you declare how one might know when a Hiue will swarne; is there no certaine rules for that?

Tortona. No surely that euer I could perceiue, especially before a Hiue hath once swarmed, but afterwards if it will swarne againe, you shall know it if you goe in the evening, for you shall heare a touting in manner like the sounding of a Bewgle horne amongst the Bees.

Petalba. I haue scene in some places where I haue beeene, that their Bees haue exceedingly lyen out upon the Hiue and board, is not that an apparent signe that they will very shortly swarne.

Tortona. Experience doth teach that when Bees doe lie out as you speake of, it is often very long ere they swarne, yea and sometimes not at all that yeere: and I take the reason or cause to be two-fold, one is when they are oppressed with heat either by the force of the Sunne or some other matter, so that they cannot well abide in the Hive, which hindereth their breeding, and also they coole themselves abroad, and therefore care not for swarming: another cause I take to be when there is good store of hony which they are loath to forsake, & so continue without for the most part rather then to swarne, yet commonly when a Hive maketh a great noise and stirre in the euening, it is a great probabilitie that it will swarne ere it be long.

Petalba. I remember, Master *Southerne* saith that if two swarmes happen to goe together, they will not be so good as one. For (saith he) although they will tarry together, yet there will be contempt betweene them, so that they will not thrive nor prosper.

Tortona. That is nothing but a meere conceit of his without probability or ground, for I hope he taketh not

Bees to be reasonable creatures to know one another a long time after there comming together, to be of another breed. And although that Bees and other unreasonable creatures meeting with others of the same kind, will often at the first sight strive and fight amongst themselues: yet being a little accustomed together they agree well enough without thinking how they came together, or contending for superioritie. For else it must needs be granted that they should haue memorie which is a part of reason, whereof all creatures (except man) are uncapable of. And for mine owne part I can assure you, that alwayes I have seene by experience that they have liked and done very well. Yet this I haue often seene, that when two swarmes have gone together of their owne accord, that one of the Master Bees hath beeene found dead upon the board or Fanne whereon the Hive hath stood, which hath beeene killed (as it seemeth) by the rest of the Bees, to avoide confusion in their government, which must needs happen by multitude of Governours.

Petalba. Because you heere speak of master Bees, you put me in mind to aske your opinion concerning them. For Master Southerne seemeth to denie that there are any such kind of Bees (contrary to the opinion of all that euer (I thinke) wrote of them) and affirmeth that Bees are led either (as other creatures) by those that put themselues formost, or else by the Drones who are more stronger and lustier then the other Bees, and doe make the greater noise which, saith he, the other follow.

Tortona. He seemeth to be of that opinion indeed, wherein he sheweth exceeding ignorance in that thing, and I therefore imagine that hee never saw Master Bee.

And

And yet me think had he no other reason to perswade him but the very master Bees houses or cels, hee might well haue supposed them to bee a different kinde of Bees from the other, both considering the different fashion in the making thereof, as also the place apt and fit for command.

Petalba. Is there any such great difference in the maner of the making and placing of their houses that should declare so apparant a difference betweene them?

Tortona. Yea for certayne very much : for all the other Bees have their houses or cells ioyned together in an uniforme order without any difference, as every one can place himselfe, which we call the combes. But the houses or cells of the master Bee , are not placed like the other, nor have the like fashion, but are made by themselves long, thicke, and much stronger then the other. Besides that , they are not ranged amongst the rest, but are placed at the passages of the Bees, as they goe to and fro up and into the hives : in such sort as a man may well perceive , are most fit to oversee and command what is needfull to be done; but I will more at large answer that Mr. *Southerns* objections in another place.

Petalba. Well Sir, then I will propound no more questions concerning that at this time, yet I remember you were of this opinion with Mr. *Southern*, that many swarmes were not good out of one hive ; what meanes is there to preuent it ?

Tortona. Surely in some yeeres, and of some hives there is little remedy for it ; neverthelesse, my order is, that when I haue had one swarm of a hive, within a while after, if it be in May or June (for if the first swarm bee afterwards, there is no great likelihood of a second or third swarm) I hoist or lift up the stock the thicknesse for

(or sometimes) the breadth of a brick, and so lay brick-bats under the hive round about, except at the mouth; prouided that they go no further under the hive, than the thicknesse of the sides ; then do I dawbe it well up againe, and make a handsome mouth, with a peece of a trencher, or little board. And this wil make them more roome, and cause them to bee busie in filling the empty place up againe, so that it is a great chance if they swarm any more that yeere: I haue scene in *Suffolk* and *Northfolk* things made of straw for that purpose, which are very good, but wee haue them not here abouts. Now if the hive bee hoisted before, then there is no remedy that I knew, but that they will swarm as often as they list.

Petalba. Mr. *Southern*, I think, speaketh of such a matter, but he would haue the hoisting taken away, and the hive set down again towards the winter.

Tortona. He doth indeed, and I cannot but wonder at his error, for I neuer saw any hive hoisted up in my life, if it were done any thing soone in the yeere, namely in May or June, but the Bees did worke downe to the board or planck they stood on againe ; and then euery man may conjecture, that the combes would be pressed and thrust together by taking away of the brickbats, or other hoisting, and many of the Bees killed, as also the place would be stopped up for others to go to and fro, and much of the hony pressed out with the weight of the hive and hony.

Petalba. Surely in reason a man would imagine no lesse, and therefore I think he must needs be deceiued in this. And yet I suppose he holdeth another opinion as absurd as this ; and that is, that hee would not have the Drones killed, who all the world hold to bee enimies to

the Bees, deuourers of their food that they should liue by in the winter, and such as altogether do liue by the labours of others.

Tortona. But therein you deceiue your selfe, for al- though, I confess, I am not fully of that opinion with him in this matter, yet do I hold also that the Drones are necessary and helpfull to the Bees, so long as they exceed not a due proportion (much like to our Lawyers) but let their number grow to great (as often it doth) and they will indeed deouore the substance of the Bees (as the Lawyers of the Commonwealth) and finally bring it to destruction. And therefore Nature hauing taught the Bees to perceiue this thing, hath also armed them to kill in the later part of the Summer, when they increase too fast, so many of them as shall bee a burthen unto them. I would reason would teach us by their example to prouide a remedy against the unmeasurable multitude of our Lawyers, which I dare boldly speak, haue the same quality in our State that Drones haue in a hive, namely to be good if they exceed not proportion.

Petralba. Then you would not kill any Drones your selfe, but let them alone to the pleasure of the Bees to kill or sauc as many as they list.

Tortona. I am in part of that minde indeed, yet haue I seene some hiues so full of Drones, as I think verily that the Bees were not able to ouermaster them without some help : and therefore in such a case I would haue you with your finger or knife (standing close by the hiue, that you see surcharged ouermuch with them) kill a good many of them as they come out and in amongst the Bees : and hauing made a good beginning, you shall see the Bees go forwards and performe the rest : marry to do it with a Spark leape or engine of rods, I utterly mislike.

mislike. For so you may kill the master Bees, or some of his brood, instead of Drones, as sometime I haue seene: and againe, by that meanes all or the most part of the Drones may be taken, which is also hurtfull, for this assure your selfe, you shall never see a hive prosper well, be it a swarm or an old stock, untill there bee some good number of Drones in it.

Petalba. Do you not remember that Mr. Southern scoffeth at Mr. Hill for a deuice he hath written, how to destroy Drones, namely by pulling off some of his legs, and one of his wings, and to let him go into the hive againe, for the Bees (saith he) will fall upon all the rest and kill them?

Tortona. As fantasticall as Mr. Hill is, that conceit of his is not altogether so absurd as Mr. Southern maketh it. For this you shall well perceiue, if you diligently obserue it, that about mid July or somewhat after, at which time Bees begin to kill their Drones, if some hive do not then fight with, and kill their Drones, do but maime or kill some two, three, or foure, and lay them upon the board at the mouth of the hive, or put them into the same a little; and this very thing will begin the fray and contention between them, and they will kill them sooner then peraduentre otherwise they would haue done: Neuerthelesse, except it bee about that time of the yeare, it will nothing at all preuaile, and that might deceiue Mr. Hill, who indeed like a forward Gentleman, published his experiments at the first sight, as he did the setting of Wheat, and many other phantasti-
call toyes, without due prooфе, good probability, or sure ground of reason. But to our killing of Drones: I hold it the best way to let the Bees themselues to execute their justice upon them whom nature hath taught to do that

which shall be for their owne good, as well in this as in sundry other matters, as experience doth well teach.

Petalba. Untill what time of the yeere will Bees swarm?

Tortona. Bees do commonly cease from swarming about the fifteenth of July, yet haue I had some in the beginning of August, notwithstanding when they happen so late in the yeere, they are nothing worth, except it bee to driue and to take that little hony and wax that they haue gathered, about September, and to kill the Bees.

Petalba. How long may it be ere a hive swarmeth, and yet the swarme in likelihood may liue?

Tortona. I cannot giue any certaine rule for that, because the goodnesse of the yeere, and greatnessse of the swarme may make much to the furtherance of the same: yet haue I sundry yeeres obserued, that those swarmes which hapned at or before the fifteenth of July, haue done well: but neuer later in all the time of my obseruation amongst Bees: and yet notwithstanding it must bee understood of such as are either first swarmes, or where two or three are put together as before is taught.

Petalba. Then it seemeth to me by that which you haue said, that all such swarmes as happen at or before mid July, are in probability likely to liue, and such one may keepe for store or else not.

Tortona. The time of their swarming (as I said before) cannot bee giuen as a certaine rule, to judge by, whether they will liue or die untill the next yeere: For I haue had swarmes about the eighth or tenth of July, that haue prospered better than some that were swarmed a month before; for it is with them as with all other

creatures, where many times the likeliest and most goodly in shew or expectancy, proue worst in the end, and those that seeme little or nothing worth, prosper and do well : Yet I must needs confess, this is extraordinary and rare. Neuerthelesse, it is worthy of obseruation, because without it you may presume of the goodnessse of a swarm according to the time of the swarming, which without other considerations may be a fальfe rule.

Petalba. What rule is there then to bee giuen to know which are likely to liue, and which for certaine will die : because (as I think) if there bee no probable hope that a hive will live, it is better to take their hony, than to lose both hony and Bees alio ?

Tortona. That is most sure, and therefore many haue endeuoured to prescribe rules for the knowledge of the same ; amongst whom Mr. *Southern* is one, who holdeth, that except a hive haue fие quarts of hony or neare thereunto, it must needs die the next winter following. But I am farre from this opinion ; for in some wet Summers scarce one hive amongst halfe a dozen, will gather so much hony as hee speaketh of. And I do verily beleue, that I haue scene swarmes liue ouer a yeere that haue not had a pottle of hony, nor yet scarce three pints in it. But I must needs confess, that there is great ods and difference in some yceres, yea almost halfe in halfe, and that consisteth especially in the goodnessse and temperatenesse of the Spring following : because from some fortnight or three weekes after Michaelmas, untill about mid February, Bees for the most part do continually sleepe, and so do spend but little of their food, so that at that time of the yeere foule weather doth them no hurt, if they bee kept dry and well stopt up ; but rather warm weather which maketh them come abroad, and

become hungry. Now about the midſt of February, the Spring being at hand, and the Sunne about noone giuing ſome forcible heat, they will then begin, if the weather be faire and warm, to look abroad, and to play about, eſpecially if the Sunne ſhine : yet do they gather nothing worth the while, untill towards Aprill, nor then neither except the Spring bee forwards, and therefore their hardneſſe, if any bee, commeth in now, and that is two manner of wayes. The one is a late Spring, by which meanes it is long ere Bees beginne to gather. The other, which is worse, is when the Spring time fal-leth out ſometimes wet, and ſometimes dry, now hot, and now cold, for heat wakeneth them from ſleep, and maketh them to come abroad, and after that cold pincheth them. Againe, wet and warm weather maketh them to drink much water, and dry and cold weather coming after it maketh them to ſcōwre, and ſo to die.

Petralba. What manner of Spring do you hold best for Bees?

Tortona. As I ſaid before, the forward Spring that is temperate. But if there happen any exceſſe, I do pre-ferre a dry Spring before a wet. For alwayes in dry Springs although they bee lateward, I haue ſcene Bees do very well, and ſwarm timely, which I could neuer perceiue in an ouer wet Spring. But to answer your former question, for the making of my choice of thofe ſwarmes I would keepe : About mid August, or ſome-what after, I take a view of all my ſwarmes, eſpecially of thofe that ſwarmed after the eighth or tenth of July, (for the other if I ſee them worke luſtily, I make no doubt of:) now thofe I lift up gently with my hands from the board whereon they ſtand, and if they be any thing heauy, and haue about three quarters or more fil-led

Ied the hive with combes, I have great hope in them.

Petalba. Have you no certaine weight that you goe by in your choyse of those that you save?

Tortona. No truely, but experiance herein must bee your best rule, let them all affirme what they list: yet I must confess, I would not save any by my will, except I did thinke them to have a pot of honey at the least in them.

Petalba. Well Sir, I suppose I am sufficiently now instructed about the ordering of Bees, and what times and seasons are best and most pleasing unto them. For if I mistake not, you would have the spring of the yeere (which I suppose you meane to be the months of March and Aprill) to be warme and somewhat dry, that they might be doing betimes, and as most agreeable unto them. The latter part of May and June, you like best to be somewhat moist, with warme shewres, because the Bees doe breed and swarme best in such weather. But Iuly you desire should be hot and dry, for that as you say, causeth great store of honey.

Tortona. Yea verily, and the yeere falling out in this manner, where Bees are well looked to and ordered as here is taught: they will in all probability bring forth great increase, and yeeld much profit to those that keepe them.

Petalba. Yet all this while you have said nothing concerning the driving of hyves, about which I have heard so great variety of opinions, as namely whether it be best to drive them, and yet to save the Bees, or else to take as much honey as one can, and burne the Bees. I pray you shew me your conceit and iudgement in this also?

Tortona. You must understand that in the driving of Bees,

Bees, consisteth all the profit that the owner maketh by the keeping of them, and therefore it behoveth you, and all men that will keepe Bees, so to doe, as you may make the most profit by them that you can devise, with the least hurt and destruction to the Bees. And this I hope no man of understanding will deny. Now, Sir, it remaineth for me to argue and prove whether of these two waies you speake of, will performe or come neerest that matter, and this is the thing (as I imagine) that you desire to know.

Petalba. Yea without all question, that is my desire indeed.

To deliver my opinion in few words, I hold that to drive them about *Bartholomew* tide, or a little after, and so to burne or kill the Bees, is simply the best and most profitable, both for the owner, and the increase of his Bees. Now my reasons to prove the same, I will briefly declare. First, the time of the yeere to drive them in, when there is any hope to save them, must needs be about Mid-summer, or before, and then there is great store of spatt and young Bees, who are altogether destroyed by that meanes. Againe, the Bees are so discouraged by the losse of that which they have gathered, that they have almost no heart to labour againe, and that may be made apparant by this. For as I said before, I have seene many swarmes that came at mid July, that have prospered and done well, but never any that were driven so late, almost by tenne dayes, (which is a great matter at that time of the yeere) furthermore, if you drive them at that time, you are sure to have small store of honey, which is the principall end of your driving of them: and lastly, which is worst of all, these Bees being thus robbed as it were of their provision, and made unsit-

or

or unable to furnish themselues againe, for the most part fall to robbing of others, and so not onely worke idly or else cease from gathering themselues, but doe much hurt to their neighbours, especially to those that have gathered least, whose Hives being in part empty, they have the more roome to get in amongst them. And by this meanes are the cause of the losse and hurt of more than themselues: as whosoever will diligently obserue them shall well perceivethe same.

Sir Petralba. If it be thus dangerous to themselues, and hurtfull to others, I wonder that so many doe accustomably drive their Hives after that manner, yet have I hard some hold opinion that it is great pitty to kill the Bees that have laboured so for us.

Tortona. A foolish custome and a fond conceit will often prevaile more with many, than either reason or experience. For now and then peradventure a Hive may be driven after that manner which doth liue, and therefore they will adventure againe upon the like hazard, hoping they may live also, which I dare undertake scarce one among five doth: and that peradventure may be with the destruction of two or three other Hives that they have robbed, which is never perceived of those that owe them. Againe, to answer their pittifull humor that they would not have Bees killed: Hath not God given all creatures unto us for our benefit, and to be used accordingly as may seeme good unto us for our good? we see that many other creatures of greater account are daily killed in infinite numbers for our sustenance, and often for our pleasure, and is it not lawfull for vs, to use these silly creatures in such sort as they may be most for our benefit, which I take to be the right use of them and the very end of their creation?

Petratba. Yes without all question, for mine owne part I make no doubt to use them so, if it bee most for our profit, and also for the good of the rest, as you have to my understanding sufficiently proved, and therefore I suppose you use that way altogether and never drive any untill about September.

Tortona. Yes that I doe sometimes, and that to my benefit. But it is onely in this case: when I have a Hive that standeth two or three yecres and doth not swarme (as amongst many Hives there will almost ever be some such) which I take to be upon some dislike, or fault in the hive, or Combcs, or else in the over bignesse thercof. About the beginning of *July* I doe many times drue such a hive, yea perhaps two or three in a yecre, and haue had very good successe after it. For whereas they haue stood before, and haue not swarmed at all, I haue had two swarmes of a hive, the next yecre following. But often and for the most part they haue prospered much better than before, and haue yeelded me some good increase. And I hold it very probable and likely seldome to faile that a hive may be driven about the fist or sixt of *July*, so that it hath not swarmed that yecre, and may doe very well: But let it cast but one swarme, and then drue it although it be a weeke sooner, and I dare holde three to one that it will perish the winter following, except the yecre be very good: For when a hive swarmeth, the most part of the Bees goe away in the swarme, as you may perceiue, for sometimes you shall haue a swarme so great, that it will almost fill a hive as bigge as that it came out of, and yet haue no Combcs in it at all: marry true it is, that they leaue much spat and young Bees behind them, which will presently after be come to perfection and ready to

labour. But if you driue your hiue shortly after, you destroy them all, and so utterly discourage and spoyle all the rest of your Bees in that hiue for euer, or else it is a great chance.

Petratba. Surely Sir, I like very well your dryving of hiues in manner as you teach; for such as haue many, as you and some others that I know: yet for a young beginner that hath but a few, to doe so, it would be long ere he shoulde increase his store, when he must kill some of them he hath.

Tertona. If it hold profitable for the increase of Bees, in many, it holdeth good also where there are few. For I will propound the case as if I had but one hive. Now I do know whether it bee an old stocke, or a swarme of the last yeere: if it be an old stocke, and I feare it will decay with age, rather than yeld increase. I will drive it betimes, as I taught in the last section, into another hiue, and not looke for a swarme no longer than the beginning of *July*. And then haue I a stock as good as a swarm, whereof I may expect swarmes three or fourre yeeres after, without neede to driue it againe: But if my stocke be young and cast me a swarne, I will not drive it that yeere, untill my store be increased: the next yeere if either one or both my hiues doe swarne, I may haue one at the least to driue and yet my stocke will goe forwards notwithstanding: and thus haue I many or few, it will be the best course for me both to preserue my stocke and to take some honey also, for there will be more honey in one hiue at Bartholomew-tide, then in fourre at mid-summer or in the beginning of *July*.

Petratba. Your reason is good, but a little more concerning the driving of hives at Midsomer, or about that time. Although it be granted, (as I confesse it is pro-

bable by that you have said) that Bees driuen at that time of the yeere, are in apparant danger of death themselves, yet can I not perceive how they should procure the hurt or destruction of any others, because the other in likelihood should bee stronger than they, and their hives better filled than theirs, and so should bee able to make resistance. Againe, why should not late swarms who are also poore enough, of which you save some, hurt their neighbours as well as the drifts?

Tortona. You must understand, that although other Bees will indeed to their power resist robbers, yet at one time or other, partly by stealth, and partly by force, they will get into their hives, and rob them, and especially in the winter time, for then other Bees sleep : but the poore ones being pinched with hunger, will in a warm day seek abroad into other hives, and yet the other Bees will at that time scant perceive them, as you may see that Mice, Spiders, Mothes, wormes, or any such like will easily get into hives in the winter, if there be any roome left for them to get in, which in the summer dare not come neere, because the Bees will then resist and sting them, being in the prime of their strength. Now why swarmes be not robbers as well as drifts, the reason is manifest : For they are composed for the most part of yong Bees, who know not how to shifte and rob as the old ones do, and having not been robbed themselves, seek not to rob others.

Petralla. In what manner do you make your choice of those stocks that you meane to drive at Bartholomewtide ?

Tortona. For the most part of the eldest hives. Because in time Bees will decay and die of themselves, although they were never driuen ; for that their combes will become

come black and unsauory, so that they will mislike them: and againe, old Bees are not so good for increase and breeding as the young, nor yet (as some hold) so strong or lusty for labour, and therefore as I said, I alwayes, or for the most part, driue of my eldest hives, ever obseruing this, that they haue cast me one swarm at the least, that yeere.

Petalba. It seemeth to me, that a hive which hath not swarmed, should gather more hony than one that hath swarmed, because in likelihood there should bee more Bees, and many hands, as they say, make light work, and fill the hive the better?

Tortona. It is out of all question, that hive which hath not swarmed, will haue more store of hony than a hive that hath swarmed that yeere, yea and often times a swarm more than a stock. But a man that desireth to haue both profit and increase, must so vse the matter, that he may haue profit for the present in such sort as he may continue, and still maintain and (if it may be) increase his stock for the time to come: for if my stock haue swarmed, I do not diminish my store, though I driue my stock, whereas if I driue it before it hath swarmed, I must driue it early, and so haue little or no hony, or else if I driue it late, lose stock and all, and so diminish my store. And yet I am not so earnest of increase, but that sometime, when I haue good store, and my Bees swarm well, I do driue one that I perceiue to be of an extraordinary waight, though it hath not swarmed at all: Marry I do not use it often, neither would I do it at all, except I had good plenty of hives, as you see, for I utterly mislike it in a new beginner:

Again, another reason why I take such as haue swarmed is, for that sometimes (especially in wet summers)

some hives will swarm so much, as there will not be Bees enough to keep the hony warm in the winter time, nor in any sort to furnish the hive ; so that they would be in danger to die, although they should not be driven, and especially if they be of any great age.

Petralba. How long do you think the Bees in a hive will continue and live, if they should not bee driven at all, but to let them alone as long as they live ?

Tortona. How long the Bees in a hive will continue and live, I hold a very vncertaine thing to affirme ; although I know that many haue let down their opinions concerning the same, with great variety and weaknesse of judgement, which I list not to stand about to confute, nor do I think it necessary. Only this I say, that no man can judge by the time a Bee will live, (although the time were certainly known, which I think no man can iustly determine) how long a hive will continue with Bees in it ; because all experience doth teach that Bees are evry yeere daily renewed in the summer time : and yet this is the rule they pretend to go by. But I think rather that this thing must bee known, by the time that Bees will like and prosper in a hive amongst their old combes, which with continuance will (as I layd before) become black and unsavory ; and that will bee sooner or later, as the Bees stand to health, and the yeeres happen to proue good or euill for them. And therefore I would aduise no man to make triall of this matter, except hee like better of curiositie than profit. My selfe do not ordinarily suffer any to stand above three, four, or five yeares at the most, for if I see a hive like well, and that doth cast me a swarm evry yeere, I let it stand the longer ; whereas otherwise I drive it the sooner, especially if it cast mee no swarm in the two first

yeeres: But then I onely change it into another hive about the beginning of July, and saue the Bees to see if they will doe better in another hive.

Petalba. Mr. Googe doth keepe a great adoe concerning the gelding of Bees (as he calleth it) and the proportion that he thinketh fit to leaue in the hives for the Bees. And I conceiue his meaning to be, to take from every hive some part, and to leaue them sufficient to keepe them in the winter, and so by this meanes doth not altogether driue or kill any at all. Ifit will performe that, it seemeth to me to be a very good way; yet doe I not remember that ever I haue hard it so much as spoken of in this Country: what doe you thinke of it?

Tortona. Marry Sir, I thinke it a very good way for those that are willing to be rid of their Bees: For let any man that hath beene accustomed amongst Bees consider, how this thing can be done, without great trouble, hurt, or danger to the Bees, and also much losse of their honey. And therefore I never knew any so absurd to practise that way that ever I could heare of, for which cause I will not trouble my selfe to confute it, as palpable enough to all men of any understanding or knowledge.

Petalba. In what manner doe you use your Bees when you drive them, doe you burne them or drowne them? For I haue heard of some that use the one way, and some the other, but whether is best I know not.

Tortona. I make no great difference betwene the one way or the other, whether is the better. But my manner of driving my hives and killing of my Bees is in this sort. When I purpose to driue any hive, I take an empty hive and sticke it, like as I haue taught to put in a swarme, and then with a sheete put about it and the

hive,

hiue, I purpose to driue, using it as the common manner is in driving of hives.

The order and manner whereof is so well knowne almost to every man, that I shall not need (as I thinke) to make any further speech thereof. But when I haue driven the Bees as cleane as I can out of the Hiue where they were, into the empty one, I set up the same in the place where the other hive stood, untill it be good and late in the night, and that I have taken the honey out of the hive that I haue driven, by which time the Bees will all be gone close up together into the top of the hinc. Then I take it from the place againe gently, and carry it to some plaine place made of purpose, and with my hand stampe the hiue hard upon the place, and so all the Bees will fall out: Then have I ready a broad board, which I presently lay upon them, and tread upon it, and so presently kill them all, that none escape, whereas, in the burning or drowning of them or any other way that ever I could see, many get away and trouble the rest of the Bees.

Petalba. I thinke it is not good to drive any biues untill night, because of troubling the Bees, and to auoyd the danger of Ringing, which must needs happen in the day time.

Tortona. For mine owne part I scldome or never driue any untill somewhat late in the euening. Yet I haue seene some drive hives at noone day, and when it is rainy, it may reasonably well bee done, yet as I said, I doe hold the euening best and least troublesome. And when I drive three or foure in a night (as sometimes I doe) it is but sitting up so much the longer.

Petalba. When you drive such hiues as are hoysted, and raised up with Bricke-bats or such other things: which

which of necessity you must take away, when you drue them : how doe you make the hives agree and fit well together that the Bees may goe well out of the one hiue into the other: because the Combines will be longer than the lower part of the hiue, and therefore it cannot come neare or goe close to the other hiue.

Tortona. For the avoiding of that inconvenience, which will be troublesome I confesse, you must do thus, Let your hive into which you will drue your Bees, be somewhat broader than the Hive you drive, and then, the ends of the Combines will goe into it, and you shall drue the Bees into it without any trouble or inconvenience at all, more than if the hiue were not hoysted at all.

Petalba. After what manner doe you order your honey, for if I be not deceived, I haue seene much better honey in some places, than in other some: But whether the cause hath beeene in the using of it, in the difference of the place where it was gathered, or in the goodnesse or badnesse of the yeare wherein it was gathered, that I was not able to determine.

Tortona. Without all doubt, any of these three causes may worke some effect in the goodnesse of honey. Yet doe I hold the well ordering of it, to be a great and principall cause to have good honey, for it may bee spoyled at the first taking of it out of the Hiue, or afterwards in the euill keeping thereof. You see what manner of honey that is, which we call Westerne honey, which for mine owne part I loath to taste, and I haue seene some hereabouts not much better. But how they use it I know not, nor haue any list to understand. But howsoeuer it might not be of the best gathering, yet I verily beleue it would have beeene much better, if it had

beene well handled. Concerning the manner that I use and like, I will shew you two wayes. The first way is this, Take a great earthen panne or such like, and spread over it a large new Canvas cloath, that is very thinne: and wring the honey out of the Combines, as hard as you can, when you haue done all, knit the cloath at the foure corners together, and hang it up by putting a sticke or staffe through at the knitting, right ouer the said panne, and so let it runne into the panne of its own accord without forcing. Then put it up into a pot that hath not beene washed, or if it be washed, let it be perfectly dry againe, and so keepe it for vse, and you must take heed that no water or other things runne neare unto it, to fall into it. For there be many things that will corrupt honey. The other way is in this sort, in stead of your cloath take a scarce and lay it over your panne, and so to refine your honey by letting it runne through it: Both which wayes I take to be good enough. And this is all that I use to doe with my honey at the driving of my hives. And as for the keeping of it afterwards, it shall need nothing else, but that the pots be close and safe from any thing comming or falling into them. And if any rosse worketh or spurgeth up (as sometimes it will doe) you must take it away. Yet this I must tell you, that the honey of a swarme will not be so thicke as that of an old stocke, nor honey that is gathered late, so good as that which is gathered in the former part of the Summer: But I suppose the chiefe reason to be, for that the former hath continued longer amongst the Bees, who with their heate haue composed it to a better substance, then that which hath lyen a lesser while amongst them, and therefore is not so well refined as the other is.

Petalba. After what manner doe you deale with your Combcs to try out the waxe.

Tortona. The manner thereof is so common and well knowne to every one, as I shall not need (but for forme sake) to say any thing thereof. And therefore I will be the more briete. When the honey is all gotten out, put all your Combcs (as well those that had no honey in them as the rest) into a good quantity of faire water, (of this water some make a kind of drink called Meath) which if you doe change your Combcs into other wa-
ter, and boyle them a little while, till the Combcs are well melted, then put the Combcs and water together into a Canvas bagge, made like an Ipocras bagge, viz.
barrow at the lower end, and straine as much as you can thorow the same, letting it runne into a vessell of cold water, casting away the rosse that remaineth in the bag. After this, gather the waxe well together and melt it in a posnet or such like at a soft fire, and let it be made into what forme you please , but if it be not purified at the first trying well enough (as peradventure it will not be) then try or melt it againe, first having scraped or pared of the rosse that settleth at the bottome. But if you will haue your waxe very yellow, you must not put to it the Combcs, of your swarmes that you drive, but try that by it selfe, for the waxe of swarmes is much whiter then the waxe of an old stocke; and being tryed with it, will make it haue a more pale colour then otherwise it would haue. And this is as much as (in my conceit) shall be needfull to be done concerning the well keeping and or-
dering of Bees.

Petalba. Mr. Googe and others that haue written of the ordering of Bees, make report of many sorts of Trees, Herbes and Plants, which as they say are profitable and

helping to Bees, if they bee placed and set neere unto them, and that by gathering of them, they will prosper and increase much the better. Therefore I pray you let me not be without your opinion, and judgement concerning that point also. And if you think them any furtherance to their prosperity, that you would set down the names of those that you think most necessary, and the manner how and when to plant them.

Tortona. It cannot be denied, that as all other creatures are benefited and furthered by such things as Nature hath created for their sustenance and delight, even so the silly Bees also are not without their benefit by being neere such trees and plants as they ioy and delight to gather of, especially such as blossom in the beginning of the Spring, when few or no plants are to bee found for that purpose growing in the fields: but if Aprill be once past, I hold it not much materiall, because then euery field hath plenty of flowers and plants for them to gather of. And therefore I do like well that you should plant such things about your gardens and yards, the names whereto and the manner how to do it, I will declare unto you, of so many as I can remember. But for those that blossom later, as things of lesse regard for this purpose, I will only name them without any more ado. And yet one thing I will here remember vnto you, that shoulde haue been spoken of before; I hold it very good to plant yong trees about and neere unto your Bees (so that they stand not to the South of them) which will be both good for them to light and settle upon in swarming time, as also for them to gather vpon their blossoms, if they be fruit trees.

Petralba. What fruit trees do you hold best for that purpose?

Tortona. Such as blossom early, as Cherrytrees, Plumtrees, and Pearetrees; and in that number you may also reckon Apricocks and Peaches, which blossom at that time of the yeere, or rather more early: for if you obserue it, you shall see the Bees exceedingly to gather in their blossoms, when they blow.

Petalba. What sorts of them do you think best to be planted, for I would plant of such as should bee best for them?

Tortona. It is not my purpose in this place to distinguish of the goodnessse of fruits, as not materiall to the matter in hand; because Bees delight as well in the blossoms of the worst as of the best. And again, I suppose it a busie peece of work to performe, for euery mans taste will challenge a censure in that thing, because we see one man loueth that which another can scarce abide to see: yet would I wish you if you plant, to plant such as are of most account, and that you shall best fancy in your taste. Now concerning the manner how to plant them, it must be done in the winter time: and if your soyle of ground be light, as of sand, or such like, then plant them between October and December, setting them somewhat deep into the ground; but if it bee a heavy soyle, and the bottom be of clay, then set them fleet and shallow into the ground, and remoue them not untill between December and February, for the coldnesse and wetnesse of that kinde of ground will do them much hurt if they be soon remoued.

Petalba. Are not Appletrees also good for them?

Tortona. Yes, without all question, they are most excellently good for them to settle and light vpon, and the Bees will also gather of their flowers or blossoms: but because they blow later, I do not account them a-

mongst those that are altogether so good as the other for Bees to gather upon.

Petalba. At what time of the yeere are they to bee planted?

Tortona. At all one time with the other trees before named, and the same manner I would wish you to obserue in the planting or setting of them.

Petalba. What kinde of soyle do Apple trees like best?

Tortona. I hold that Appletrees do best delight and prosper in a soyle mixed of clay and sand; For sandy grounds will make them much subiect to the canker, and claiy grounds as much to bee annoyed with mose, and therefore it is out of all doubt, that a soyle composed of them both, is most fit to plant them in. But herein I would not haue you take me to mean such a mixed soyle as many yards and gardens are, which with continuall dunging grow to be a black earth, for in such grounds Appletrees are most of all subiect to the canker; but I meane it of such as naturally or by art haue such a mixture, without any dung.

Petalba. Do you hold dung to be hurtfull to trees?

Tortona. Yea verily, and this is a generall rule, that for the most part of plants and herbs dung is very good and profitable, but for trees I hold it rather hurtfull than good?

Petalba. Now you haue spoken of trees that you hold best to be planted for the benefit of Bees, I pray you do the same also for herbs and plants.

Tortona. In the first place for plants that blossom early, I will remember Rosemary, which flowreth both in the Spring and againe in Autumne, in the flowers whereof Bees do exceedingly delight: it is planted of

the slip, and almost at any time of the yeare, especially in the Spring ; it prospereth best in a light soyle, and is to bee planted on the South or West side of a wall or pale, for it loueth warmth, as a plant that groweth naturally best in hot countreys.

Borage also is a plant in the flowers whereof Bees do very much delight to gather, and it blossometh most part of the yeare ; it is planted best of the seed, at any time of the yeare, and loueth a fat soyle.

In this number I will also place the Raspis or Iramboys, although that they flower somewhat later than the other, for it is exceeding that Bees will lie and gather in them : they are planted of the yong shoots from the roots, in February and March, and joy in any kinde of ground almost, so it be any thing good.

There is also a little plant called Pulsatilla that flowreth in the beginning of Aprill, that they also much delight in : it is planted of the seed, in the winter time, and loueth somewhat a fast and stiffe soyle.

Rapes, Turnips, and Cabbages, are plants that Bees delight to gather in their flowers, but they flower in the second yeare after their planting, they grow of seed, and delight in a fat and well dunged soyle.

Bearfoot is also a plant that flowreth early, and Bees do much delight to gather of the blossomes thereof ; it is planted of the seed or yong sets in the Spring, it loueth a good and fat soyle, yet is apt enough to grow any where.

Beanes are also plants that Bees do much delight to gather in their flowers, who if they bee planted early, will blow in March and Aprill, and so be very good for Bees that are neare unto them ; the manner of planting of them is so commonly known, as I need say nothing thereof.

Sundry other small plants there are that flower early, which Bees will gather of, as Primroses, single Violets, and such like, the recitall whereof would bee to small purpose, because those most materiall and fittest to bee planted, are aforesnamed.

Petalba. Then you are of opinion, that these plants and trees, or the most part of them, you would aduise such as keep Bees, to plant about them.

Tortona. I do indeed, for as I haue elsewhere sayd, in the Spring of the yeere when Bees are weak, and little or nothing to bee found in the fields, a very small thing maintaineth life, and cherisheth them, as mine owne experience hath taught me. For by reason that I haue some plenty of such trees and plants, I haue seen my Bees lusty and strong in the Spring, when others haue beene feeble and weak, yea and haue wrought and laboured well, when others haue found little or nothing abroad to do them any good.

Petalba. You speak as though there were many other plants that blossom more late in the yeere, which Bees also do gather of, I pray you which be they ?

Tortona. If May bee once well entred, the fields almost euery where yeeld abundance of flowers, both for the profit and delight of all creatures, as especially for the benefit of Bees, a catalogue of the most part of those that they vsually gather of, I will briefly set down ; not for that I hold it necessary to plant them in gardens, or other places, for the benefit of your Bees, (except such as serue for other good and necessary usses) for that were an endlesse work, but only to acquaint you with their names, and to satisfie in part the minds of some curious readers.

I will begin with the Sallow tree, which beareth the Palme,

Palme, vpon which Bees will gather exceeding much, and it might haue been placed among the formost number, for the timely Blossoming, and the profit that Bees take by it, but that it is of that sort which is not conuenient to be planted neere a house, nor in a garden or orchard, because it beareth no fruit, nor hath in it any delectation or pleasure for any extraordinary use or delight.

The Maple also is a tree that Bees much delight to gather in the flowers thereof, and they also come somewhat early.

The Birch and Beech trees are also good for Bees to gather in the time of their flowring, as also the plants following:

Angelica, Melilot, Stecados, Avens, Solidago, Sazanica, Virga aurea, Lismachia, Radix cava, Mal-lows, Balme, Clover, especially that with the white flower. Bramble or Blackberry bush; in the time of the flowring of this plant hapneth the greatest plenty of hony. Thyme, Branck or Buck Hisop, Lavender, Sage. And these are the principall that I can now call to remembrance.

Petalba. Are there not some trees and plants that are hurtfull vnto Bees, and so not good to bee placed neere them?

Tortona. Yes, sundry, whereof the cheifest are these that follow: the Yew tree, the Box tree.

And of plants theſe, Spurge, Wormwood, Woad, wilde Cucumers, Mayweed: ſome hold the Elm in flowring time to be hurtfull for Bees.

Any oylie or vntious matter is very hurtfull for Bees.

Pet. Sir, I am bold to claime your promise, for your fur-

ther declaration vnto me of the nature, breeding and government of Bees.

Tortona. Sir, I will declare unto you my opinion and conceit concerning your request. And yet I must heere tell you, that as in our former speech I did chiefly trust to mine owne experience and practice amongst Bees; in this dayes worke I must as much leane to, and be ruled by the opinions of others: now and then mixing amongst them some of mine owne observations and experiments, yet so, as I rather leave them to the consideration of those of better iudgement, then affirming them as a certaine and undoubted truth. Because many of the questions that will offer themselues here to be considered of, are so intricate and doubtfull, that they shall neede much observation and great iudgement to determine. But to proceede, *Aristotle*, *Virgil*, and divers others that have curiously searched and written, of the nature, gouernment, and breeding of Bees: doe make many sortes and kinds of Bees, as well for their difference in their quantity and bignesse, as also in their fashion and forme. *Aristotle* he liketh best the short, speckled, and well knit Bee, and *Virgil* preferreth the long, smoth, and faire Bee. But for mine owne part, as one not so well acquainted with the variety of their kinds (wherein I could never perceive in our countrey any great difference) I doe like best such Bees as be gentle and well coloured, for the waspish and fell Bees are never good, neither for increase or profit, and the evill coloured are not in health.

But because every man must content himselfe with such as he hath, or can get, it behoveth those that haue of the worst sort, so to use them by gentle and good meanes, that their curst and waspish qualities, may bee
bemarred

bettered and made more gentle.

Pliny saith that the Bee is the onely best of all Insects whatsouer, exceeding every one in profit, excellency and use, they are creatures of a strange composition and much stranger substance, for they have neither flesh, blood, bones, or sinewes, doe not moue by ioynts, haue neither chyne, nor gristle; fat or excrement; but are compact and made of a corporeall substance or middle nature betweene all these, through which the life or mouing is dispersed generally and not seated or settled in any particular part; as other creatures haue in the heart and in the braine, whence it commeth (as we see by daily experience,) that if you devide and cut them or dismember them into two parts, each part will equally liue a long time after such dismembrings.

They haue no Intraylls or other inward Organs, by which either to retaine or evacuat, onely a certayne Conduite or pipe, which instead of a gut (being wrapped together carrieth and disposeth whatsoever it receiveth.

They haue many feete, that is to say, sixe, and the reason thereof is, because (as before I said) the vitall parts are not seated in any one member, but dispersit abroad and communicated to every other part of the body, holding the least of it residence in the head.

They haue wings to transport and carry them to what place they please, and also to bring them home when they are laden with the wealth and riches of their labours.

Their feete are crooked, and longer from the bent downeward then from the bent to the body, and the longer the feete are, the better: for it is a great signe of long life and faithfull labour.

They haue all the five senses which man hath, and in a liberall proportion : As first eyes, by which they see and discerne to distinguish of one Flower from another, and to make choice of that which is most amiable and best agreeing to their natures and profites.

Then hearing, by which they listen unto sounds, as the commands of their Soveraigne or Master Bee, the noyse of their companions and their one or others Musick, as we see by daily experience, when the tinkling of a Bason or such like Instrument will congregate and gather them together, when the swarmes are never so farre or wide dispersed.

Then smelling, by which they know the sweet Flowers from the bitter hearbs, cleaving unto Roses, Violets, Buglosse, Borage and the like, but eschewing and abandoning Onions, Garlick, Rew, and Hemlocke, nay so excellently curious are they in their smelling that they will not abide any distastefull smell that is about them that Gouerne them, and will naturally take an offence at a stinking breath.

Then feeling, as is most easily to be perceived by their embracing and loue to the things they affect, and the offence and reuenge they take, when at any time they are opprest or offended, being so sensible of paine that they will lose their sting (which is halfe a losse of life) rather than to bee tormented, or pained above their nature.

Lastly, they haue the sense of tasting, being able to iudge which Flower is sweete and will affoord plenty of Honey, and which is gummy or flymic from whence they may draw waxe.

The Bee (of all creatures) is the most laborious, and neuer giveth over his dayes labour from the midst of April

Aprill till the beginning of November, neither would he then ceaie, were it not for his two mortall enemies, Snow and Frosts, the bitterness of both which he can neither indure nor suffer. And thus much I thought good to say concerning their nature or kinds.

Now concerning their breeding, there is much adoe, and great variety amongst writers, as well for the manner of their breeding, as also for the time of their bringing forth, and the comming to perfection of their brood. Some hold the Drone to be the Male, and the Bee the female, and that they ingender by copulation. Others affirme that they ingender not, but that they gather their young ones, upon some Flowers: againe some are of opinion that the Kings or Master Bees, doe ingender all the rest: and some that they lay egges and sit upon them, which will come to be Bees in 45 dayes. But I am of opinion with Mr. Southerne, that they doe blow as a Flye and Waspe doth in their holes or Cells, and as the blowes of the Flyes are nourished by the flesh wherin they are blowne, and the young of the Waspes by the earth wherein they are bred, so the spat or brood of the Bees are nourished by honey and water: For in the Combes wherein they are bred, you shall see every second or third hole or cell filled with water or honey, whereof if they want, their spat will perish. And if they are bred by copulation (as some affirme, and as may be, without contradiction to the former opinion) being thereby made able to spat or cast their brood, I cou'd like of their opinions which hold the Drones to be the Males. Because all experience doth teach that never any Bees were, or can be without Drones; and therefore without all doubt nature hath created them for some principall use: and I nor no man can perceive any

greater then this, or as almost fit for little or nothing else.

Petalba. If that were so, me thinke there should then be as many Drones as Bees, and againe the Bees would not kill them, because we doe not read of any other creature, that the Males are killed by the Females.

Tortona. You must not thinke that I would certaintly affirme that, which so many learned men have but gesled at, yet by way of reasoning I may thus much say in answer of your obiection: We see that many creatures doe increase best, when there are but a few Males amongst them, in comparison of the Females, as Kyne, Sheepe, Concyes, and many others; and although the Females of these kinds cannot, or will not, kill their Males themselues, yet who knoweth whether this be not a peculiar property in the Bees or no, when they find themselues to be surcharged with them. And this is most certaine, that the Bees never fall to killing of their Drones untill breeding time be almost out for that yeere.

Petalba. How long is it ere the spat or brood of the Bees will come to perfection, and be ready to gather?

Tortona. Most of the ancient writers doe hold, that from the first casting of their spat to the comming forth of the same, it is forty and five dayes. But Mr. *Southerne* affirmeth, that they bring forth their brood in fifteen dayes at the most. Yet notwithstanding Mr. *Southernes* supposed reasons to the contrary, I rather yeeld to the former opinion, as most probable by farre in my conceit.

Petalba. I pray you what are his reasons that he aleadgeth against so many great and ancient learned men?

Tortona. He alleadgeth two, but the former of them he answereth himselfe, namely, that an old stocke after it hath cast a swarne within nine dayes hath cast another, but (this saith he) may be alleadged to be of the remnant of the other, or else some that then were almost ready to flye, and I say that this allegation is true: for I have often seene a hive cast a swarne, and within foure dayes cast another.

His other reason is, that he hath had a swarne put into a newe hive, which hath swarmed againe within fifteene dayes after, and therefore hee concludeth that these must needs be bred since their putting into that hive.

Petalba. His first reason I confess it is but weake, but, how doe you answer this last?

Tortona. For answer of the other, I said that no greater prooef then he alleadgeth, cannot (in my conceit) weigh downe, the long observations and reputations of so many learned men, concurring in one opinion, whereof no doubt some of them might and did make tryall. But to let them passe, I hold that a great swarne (having laboured 15 dayes, in which time about the begining of July, they might almost fill the hive with waxe and some honey, and also haue left good store behind them of spat) may swarne out more then halfe the Bees, which will be a pretty swarne, and yet leaue some store behinde in the hive to maintaine their spat, and also to labour untill the other be ready: as my selfe haue seene the like. Neverthelesse when such a thing happeneth, it is as I thinke upon some fault in the hive, or other dislike, and will put the same in danger to dye the next winter as himselfe confesseth, which could not be, if all the old store remain'd behinde, who were able wel to maintain the hive.

But in very truth, whosocuer shall obserue the manner of their breeding, must needs confess, that they can not bring forth in fifteen dayes, nor neere unto it, as Mr. *Southern* conceiteth ; for when Bees first cast their spat, it is as small almost as a little fly-blow, then it increaseth to the fashion of a worme, and will be quick, and dieth again, lastly it obtaineth the form of a Bee some good time before it come to perfection, whose continuance is so much, that by mine owne experience I dare affirme, that Mr. *Southern* is mistaken in this matter.

Petalba. Although this should be granted that you say, yet how should they do for another master Bee to go out with the swarne, or else to remaine behind in the hive ?

Tortona. I do not take it for certain, that there is but one master Bee to a hive, or swarne, for some hold there are to euery one two, and some more, and yet peraduenture, the multitude of master Bees in that swarne, may be one principall cause to make it swarne againe ; for it is an extraordinary matter to haue a swarne cast a swarm againe, especially so soone as Mr. *Southern* speaketh of, namely within fifteen dayes ; y^c I confess, I haue seene the like by a great and forward swarm, or when two haue gone together of their own accord, betimes in the yeare.

Petalba. But how do you know that the swarm that it cast was not of a new increase ?

Tortona. Besides the reasons that I haue alleaged, this also may bee added, for that in the like case a man shall perceiue but a few Bees to be left behinde, for they will work much more slowly vntill the time come to bring forth their brood, and then they will bee full again, as before, which would not be perceiued if the old

Bees had been all sett behinde.

Petalba. What part of the yeare do you take to bee the principall time of their breeding?

Tortona. They will breed or spat from Aprill vntill it be mid September; but the principall time I take to be between mid Aprill and mid July; for between those times, if you drue any hive, you shall euer finde great store of spat and yong Bees: and yet a swarm will breed very much, euен vntill the end of August.

Petalba. Here commeth to my remembrance a question, which I purposed ere this to haue propounded vnto you: I beleue you haue heard it to go for a common receiued opinion, that Bees after they haue lost their sting by stinging of any thing, will bee Drones, which Mr. *Southern* seemeth to scoffe at, I pray you, what think you concerning that matter?

Tortona. I am fullie of Mr. *Southern's* opinion for that, because what Bee soeuer hath lost her sting, shall lose her life also within a short time after, as losing some part of her intrals withall, for Drones are bred as other Bees are, as any man that drieueth a hive, shall well know the Drone spat by the bignesse thercof, before it come to any perfection.

Petalba. Well Sir, now I pray you, let mee haue your opinion concerning the King, or master Bee, first for his quantity and form, for their number, and lastly for their power and command ouer the rest of the Bees?

Tortona. Aristotle and Virgil do make mention of two sorts of Kings or master Bees, the one sort being of a golden colour, very fayre and gallant to the sight; and these they suppose to be the best: but the other sort are of the colour of other Bees. Now all the master Bees

that euer I saw, differ little in colour from the other Bees, but that their legs are yellow, inclining to a golden colour : they are bigger than another Bee, and much more longer, almost by the one halfe.

Concerning the number of them in a hive, I dare not determine any thing for certaine ; yet do I think that one hath the principall command, if they agree and prosper well : their yong ones or spat are bred in their owne houses or cels, and not amongst the other Bees, as I haue often seene.

Now for their authority and command, with the great obedience whiche the other yeeld unto them, I will cite the opinion of Virgil, Englisched by Mr. Geoge.

*Not Egypt in his prime,
Nor Lydia large and wide,
Nor yet the Parthian people great,
Nor all the Medes beside,
Do so their King obey,
Who being safe and well,
Their minds are altogether one,
He only beares the bell.*

If the King perish, the rest of the Bees neuer prosper, but come to nought. Not long since I had two swarmes did arise almost at one time, and when the first was almost hived, the other came to them, and when part were gone into one hive, I tooke that away cleane, and put another hive in the place, into which the most part of my Bees went, and I set them up both, but that which had most Bees, by little and little came to nothing ; and I take the reason to be, for that both the master Bees were gone into the other hive, before I tooke it away, which the other could not finde, and therefore perished, as I say ; for when I came to take a view of

my Bees in August, I found that they had almost gathered nothing, which I doubted before, by their lasie going out and in.

Petalba. It is a maruell that Mr. *Southern* should be so much deceiued, to think there are no such Bees, contrary to the opinion of all men.

Tortona. As I said before, so I say again, I do much wonder at it, in a man of any practice amongst Bees, for by the very master Bees houses, which he could not bee ignorant of, but must needs imagine such a kinde of Bee. And I do verily beleue that there is not any man that ever did drue a hive with any obseruation, but will condemn his opinion, as altogether absurd, although that he never saw master Bee himselfe.

Petalba. I pray shew unto me at large the difference you speak of.

Tortona. You must understand, that all the other cels or holes, are made and placed in one uniform order, as a troop or squadron of souldiers ranged in order of battell, or lodged in a well pitched camp ; every cell or hole being six square, according to the number of the Bees feet, and of the depth of a Bees length and somewhat more ; and this order is double, as you see with a filme or stop in the midst, that the one Bee cannot go thorow to another, so that the thicknesse of this workmanship or frame, which we call a combe, is as thick as two Bees are long, and are commonly as broad as the hive is wide, and as long as the hive is deep : all which are placed so neare one to another, as the Bees may conveniently passe to and fro between the said combes. But the master Bees houses or cels are not ranged or placed in the forme and order of the rest, but are seated upon some side or top or corner of a combe, in or neare such places as the Bees

most commonly passe by with their substance that they gather : and as the Captaines or other Commanders are pitcht in a camp, or in the head or place conuenient in a troop or squadron of souldiers. Againe, the fashion of them is nothing like the other, but they are sumptuously built round, thick and long, very artificiall and stately.

Petalba. Is there but one of them in a hive, or do they build many such ?

Tortona. There are sundry of them in every hive, but the number is uncertainte, yet did I never see fewer then 5 or 6. nor ever aboue 9 or 10. which being placed and dispersed into sundry parts of the hive, seeme to be places of remove as occasion shall require, to oversee any part thereof.

Petalba. Doe not the Master Bees breed or spat in their houses, as the other Bees doe in their Combis or Cells.

Tortona. Yes without all question, for my selfe haue often times, found of their young in some of their houses of all sorts, namely, some ready to flye, and some white spat, and they hold that these Bees have wings and feete at the first, and are not like a worme at all as the other Bees are.

These Master Bees are absolute in their authorities and commands, and out of a regall power or civill discipline answerable to our Marshall lawes, and as having a supreame prerogatiue aboue all the rest, he over-vieweth all that are within the compasse of his squadrons, he administreth Justice unto all, correcting the lazie, sloathfull, and disobedient, and giving honour and incouragement to those which are painefull, laborious and diligent : In recompence whereof, and as it were a Tribute

due unto him from their duties, they offer unto him all their services and loyalties, guarding and defending him from all dangers whatsoeuer, either civill and domestike, as in his owne hive, or forraigne and abroad when they encounter with the assaults of other strange Bees.

This Master Bee doth not alone after a generall manner take view of their generall labours, but particularly over-looketh every particular worke, every edifice, building, store-house, and whatsoever is necessary and appertaining either to the support or maintenance of that little Commonwealth, and wheresoever he findeth error, there he inforceth a present amendment.

This Master Bee hath a sting as well as the rest, yet more for ornament then use, being so guarded and defended by those Armies which incampe about him, that he seldom or never findeth any occasion to employ it?

Againe, as he hath this generall guard of the whole multitude or Army of common souldiers, so he bath a selleet and particular guard of choice officers or supreme Commanders, as Generalls, Lieutenant Generalls, Marshalls, Sergeant-Majors, Colonells and Captains; and these whensoeuer he pleaseth to issue from his hive attend on him in a singular and formall equipage, being so Marshalled abroad, and incamped at home, that no Military discipline can either exceed or amend the excellency of their orders; and thus much I think shall suffice concerning the breeding of Bees, and the power of the chiefe commander.

Petratba. Well Sir, now I pray you let me have your opinion concerning their order and maner of government, so much spoken of and admired, as well the ordering themselves in their hives, as in disposing themselves to labour abroad, and their gathering admirab'e

and profitable commodities.

Tortona. They live together in their hives, as it were in a Campe, and duly keepe their watch and ward at the mouth or hole of their hive: in the morning you shall see them goe forth warily, not too far at the first, especially if the weather be suspitious, whereof they seeme to have some knowledge by a certaine kind of naturall instinct, as the Poet hath well observed in these words.

Vir. *Nor from the hives if likely it be to raine,
They farre doe stray, nor trust they will the skie,
If that the South winde blow but still remaine
At home or busied be with water nye.*

Being loaded they flye with the wind: if any tempest suddenly arise, they countervale themselves with little stones, flying in the wind as neere the ground as may be, they labour both at home and abroad as appointed, as Virgil affirmeth in these words.

*Some range for food,
And ply the fields abroad,
Some still at home,
Doe libour busily,
And round about with waxe,
The hives doe loade,
Which from the gummes,
They painefully doe trye.*

For they gather the waxe of Flowers and gummy substances that they find, as may be well perceived by their going home loaden therewith, upon their legges and backs.

Petalba. It is a common received opinion, that Bees gather as much honey of Flowers, as waxe, if not more.

Tortona. I doe confesse it is, and I will not deny but that they may gather honey upon some Flowers, as up-

on the Bramble Flowers, Clover, and some other that blossome about the time of yeere when they gather most honey. Yet for the most part I am fully perwaded they gather very little honey upon Flowers, but almost altogether waxe, except onely sufficient to maintaine life, and to breed withall, and yet they want of that also in the dry and cold times that after happen in *May & June*: but of this I haue spoken before; where I shewed what Trees and plants are good for Bees, and how the Bee garden ought to be accōmodated with al things that are necessary for the benefit and increase, both of honey and waxe. And so I conclude this short discourse or History of Bees with
that of *Virgil*,

Sic vos non vobis, &c.

FINIS.

Rich: Grantwhite

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1801

G.W.

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